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HOW TO: Trim the fat from \

Ed Word

How I Learned to Stop Worrying and Love the iPhone

Please send feedback and split-pea soup to ***will@maximumpc.com.***

I had been a vocal critic of the iPhone since the beginning. I have very little use for a "smart" phone that doesn't support third-party developers and the applications they build. I have even less tolerance for a smartphone that doesn't support Exchange, which my company uses for email and calendaring. The iPhone supported neither of those features, which made it a no-buy for me.

Then, on a glorious morning in March, Steve Jobs erased both of those roadblocks at once, announcing native support for the Exchange ActiveSync protocol and a fully featured (albeit Mac-only) SDK for the iPhone. Coincidentally, on the very same day, the bottom row of keys on my clunky old Windows Mobile phone stopped working. I guess I could have charged on and learned to communicate without using the letters *C*, *B*, *N*, and *M*, but I just couldn't sacrifice the comma and period. This was my perfect storm. At lunchtime, I trotted down to my local AT&T store and bought a shiny new 16GB iPhone.

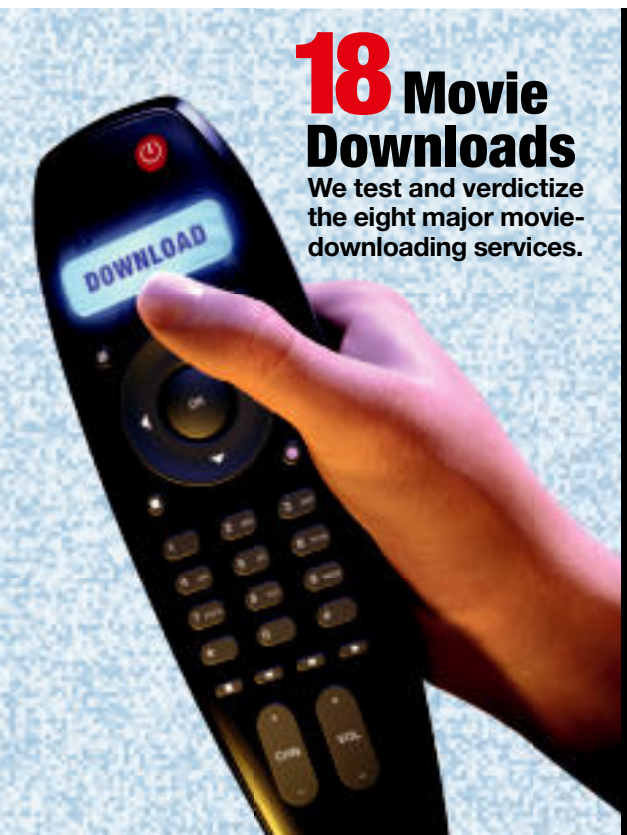
I activated the phone and set up both my personal Gmail and my work Exchange email (using the built-in IMAP client). At this point it would have been handy to know that full Exchange support is coming via a firmware update in June. Oh well. I got the phone working using IMAP and a Gmail hack. I copied some MP3s from iTunes and was on my way.

I spent that evening playing with the iPhone and became simply entranced by the interface's lightning-fast response time and well-thought-out default options. Even then, with the promise of full version 2.0 firmware just around the corner, it was mere hours before I strayed to the dark side. Lucky for me, jailbreaking new iPhones, and thus enabling the installation of thousands of third-party apps, is simpler than ever before. I downloaded ZiPhone **www.ziphone.org** and was running third-party apps in mere moments.

What amazes me most about the entire iPhone experience isn't the intuitive multitouch interface, the gorgeous hardware-accelerated graphics, or even the slick integration between contacts, calendar, and the phone app. No siree. What amazes me most of all is that even the apps created by unsupported third parties, without the benefit of a real SDK, are polished to a high sheen and eminently usable. Well done, iPhone hacking community!

Of course, it's not all wine and roses. The biggest downside to the whole iPhone purchase is that Gordon Mah Ung's anti-Apple vitriol is no longer aimed at associate editor David Murphy but instead spewed directly at me.

Features



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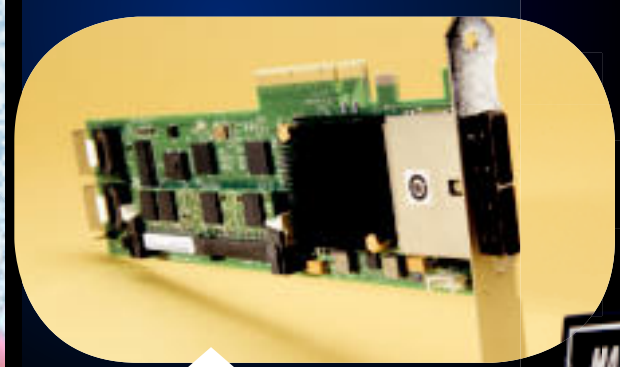

54 Softy Awards Once again, we bestow our coveted award upon the best apps we've installed this year!

42 RAID In an epic battle of eight controller cards and two motherboards, we'll show you which one does RAID right.

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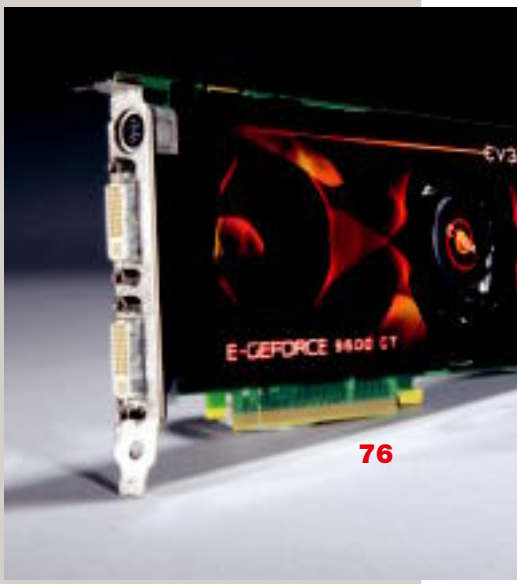

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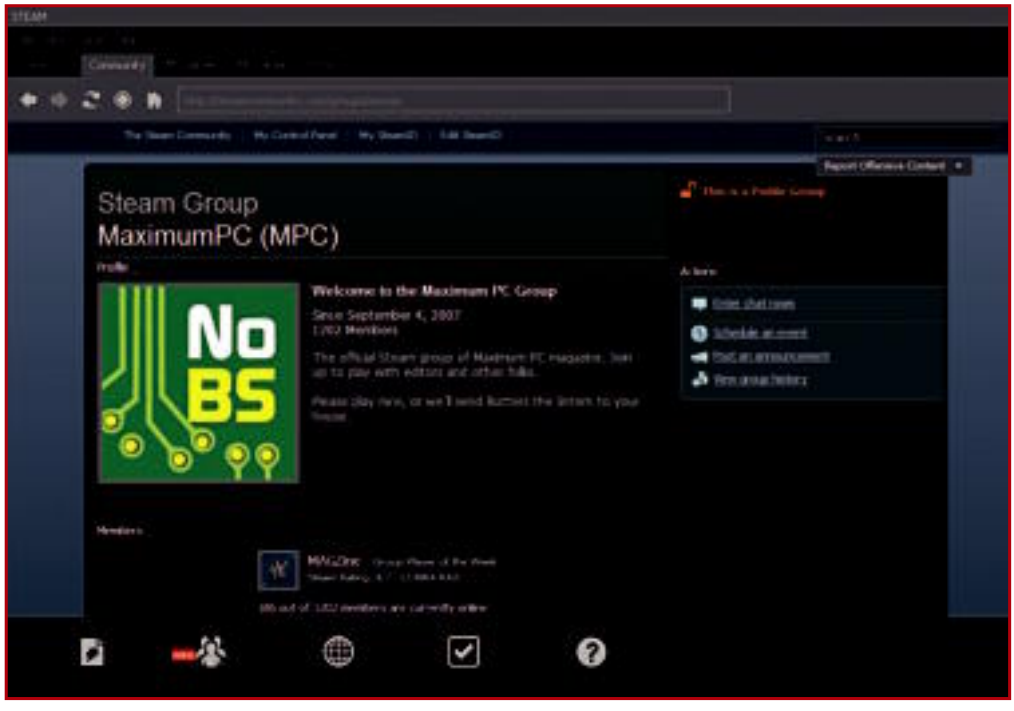
PC Gaming Alive and Kicking

Hardware and software vendors join forces to promote PC gaming



The perception that PC gaming is dying may be the result of untallied sales from download services such as Steam.

When the formation of the PC Gaming Alliance (PCGA) was announced at this year's Game Developers Conference, you didn't have to look any further than the news stories covering its creation to understand why the mega consortium of PC hardware and software companies felt compelled to create such an entity.

In one breath the press would mention Intel, Microsoft, AMD, Nvidia, Dell, Acer, EPIC, and other industry luminaries banding together to promote PC gaming, and in the next it would point to the "grim" market numbers: a 6 percent decline in sales of PC games to just $911 million.

That's the problem, according to Randy Stude, president of the PCGA. While there's no shortage of high-fives and backslapping when the subject is console-gaming sales figures, PC gaming is always discussed in the hushed tones typically reserved for the critically ill.

Stude says that job one for the PCGA is to address the perception that PC gaming is on its last legs. The group points to numbers from market research firm DFC Intelligence, which show PC gaming sales in the U.S. last year at $2.76 billion—an increase of 12 percent.

Why the disparity in figures? The problem, according to Stude, is inconsistent reporting methods. NPD—the organization whose sales numbers are most often cited by the media—doesn't include online gaming, e.g., Steam and World of Warcraft, in its totals. And as for hardware, shouldn't a high-end gaming system, $1,000 CPU, or $500 GPU be considered in the PC gaming numbers? The PCGA hopes to be a central depositary of more accurate PC gaming figures.

The group also hopes to address the "massive" piracy problem affecting PC games and the phishing of online gaming accounts. Another goal of the PCGA is to develop more reliable minimum hardware specs for game developers to follow to help clear up consumer confusion as to what games can run on what system builds.

Today, however, the group is short on details and long on goals. Members admit that there's much work to be done, but they say you have to start somewhere.

Still, will the fellowship hold together if, say, the members decide not to recommend Microsoft Vista as a gaming platform? What happens if the group says people should (as we recommend) avoid integrated graphics like the plague? Stude, from Intel, says he hopes the alliance will survive such challenges but membership is voluntary. Others in the PCGA say that despite the questions and doubts, at least a group now exists where such discussions can occur. And at least there is an organized body that's finally waving the flag for PC gaming.

IS PC GAMING DYING? SEE FOR YOURSELF

US PC GAMING REVENUES 2007	$2.76 billion	+12 percent
US PC GAMING REVENUES 2008	$3.1 billion	+14 percent (forecast)
WORLDWIDE PC GAMING 2007	$8.3 billion	+14 percent
WORLDWIDE PC GAMING 2008	$9.6 billion	+16 percent (forecast)

Source: DFC Intelligence

Intelliscanner Mini

The Intelliscanner Mini lets you scan the bar codes on just about anything in your home and then upload that information to a database program. While keeping an up-to-date spice list on your rig is of little value, media hounds will find the device provides an easy way to track book, CD, and DVD purchases—the device even automatically logs cover art and a variety of release information in the database. $300, www.intelliscanner.com

Wikileaks Back Online

Judge reverses prior order to shut down whistleblower site

U.S. District Judge Jeffrey White recently reversed his own decision that forced domain registrar Dynadot to take Wikileaks.org, a website for whistleblowers, offline. The site contains more than 1 million documents posted by individuals wishing to call out unethical behavior by both businesses and governments.

Attorneys representing Swiss bank Julius Baer and Co. argued that the site had posted fraudulent documents that described the bank as engaging in money laundering and tax fraud; however, free-speech groups countered that taking down the site constituted prior restraint, and this seemed to sway the judge to reverse course. The short-lived shutdown notice, in reality, did little more than increase traffic to Wikileaks, which remained accessible via mirror sites as well as its IP address.

Wikileaks:Submissions
Submitting confidential material to Wikileaks is safe and easy. We have several methods, but the best for most submitters is:
Click here to securely submit a file online

Have you become privy to corporate malfeasance? Anonymously spill the beans at Wikileaks.

Bookin' to the Future

Like the record companies before them, book publishers are now finally embracing the Internet as a necessary component of doing business in the digital age.

Random House is clearly taking its cues from the music labels with its new single-chapter download model, currently in use with only one title. For $2.99 per chapter, you can download just the parts of the book you're interested in—a model that's obviously suited for only certain types of nonfiction.

HarperCollins, on the other hand, is offering entire books online for free—although, they must be read from within the HarperCollins website. At the time of this writing, several titles were available as part of the Full Access program, including *New York Times* bestsellers *The Witch of Portobello* by Paulo Coelho and *American Gods* by Neil Gaiman. The latter came about after fans of the author's blog (www.neilgaiman.com) voted that book the one they would most like to give to a friend who was unfamiliar with Gaiman's work. For all of Harper's other titles, website visitors can peruse up to 20 percent of a book's contents.

Harper's enticement model is one that was forged several years ago by Boing Boing editor and sci-fi author Cory Doctorow, who has made electronic copies of his books available for free under Creative Commons licenses, knowing that a percentage of downloaders will be tempted to buy the print edition. The model has proven successful enough that Doctorow's publisher, Tor Books, is now offering free digital downloads of some of its other authors' work.

TOM
HALFHILL

VIA's New Isaiah Processor

These are exciting times for mobile PCs. A new category of sub-$500 subnotebook computers is emerging, inspired by last year's Asus Eee PC (see March column) and the Everex Cloudbook. By the end of this year, you'll find a dozen or more different models of teeny-weeny PCs in stores. Some prices will fall below $300.

As I wrote last month, Intel and VIA Technologies are introducing new low-power x86 processors for these systems. In affluent markets, Intel and VIA hope their OEM customers will sell these new PCs to people who already own a regular desktop PC and perhaps a regular notebook as well. In developing markets, the targets are first-time buyers. Intel nicknamed the subnotebook computers "netbooks," emphasizing their built-in wireless Internet connectivity. Even smaller are handheld computers called MIDs (mobile Internet devices).

VIA's Isaiah processor is definitely a contender in this game. It's a completely new x86 design from VIA's Texas-based Centaur subsidiary. To some degree—although VIA doesn't welcome the comparison—Isaiah will compete with Intel's new Silverthorne processor, recently named Atom, which I'll talk about next month.

In recent weeks, I have carefully analyzed Isaiah. Unlike VIA's Centaur C7 series, Isaiah is a full-featured 64-bit x86 processor with three-way superscalar pipelines, out-of-order instruction processing, speculative execution, the latest virtualization extensions, strong multimedia performance, and a fast FPU. Isaiah can deliver two to four times more throughput than the C7-M when running at the same clock frequency.

Although Isaiah still isn't as fast as Intel's Core 2 processors, it consumes much less power. Remarkably, Isaiah holds the line on power, relative to the C7-M. Initially, Isaiah will draw only about 3.5W at 1GHz or 6W at 1.5GHz. Those specs are worst-case thermal design power (TDP)—typical power consumption is lower. The initial version of Isaiah can reach 2GHz, but power rises to 16W. Ultralow-voltage versions will consume only about 5W TDP at 1.2GHz.

Isaiah is more power-hungry than Intel's Atom, but early benchmarks suggest it's faster. Both chips should thrive in subnotebooks. Soon we'll have our choice of affordable PCs small and light enough to fit comfortably in a backpack or airline carry-on bag without displacing other stuff—and with longer battery life, too.

Tom Halfhill was formerly a senior editor for Byte magazine and is now an analyst for Microprocessor Report.

GAME THEORY

THOMAS MCDONALD

The Alliance of PC Gaming Buzzwords

Does the industry really need another trade organization? Apparently so, judging by the splashy, almost 100-percent content-free launch of the PC Gaming Alliance. Its initial press release promised that the "PCGA and its member companies will work to accelerate innovation, improve the gaming experience for consumers, serve as a collective source of market information and expertise, and get those unsightly rings out of your bathtub."

OK, so I added the last part, and, yes, I'm being grotesquely unfair. The PCGA is a new entity attempting to do good for the world of PC gaming and includes the participation of most of the major hardware and software developers. So far it's produced only airy generalities, but that's to be expected this early in the life of any group.

The question remains, however: What, specifically, does the PCGA hope to accomplish? The website boldly proclaims that the organization is "the Authoritative Voice of PC Gaming World Wide" and promises to "make data that highlights and promotes the PC platform to analysts, press, and the public."

That makes it sound like its purpose is to issue press releases and keep someone on staff to write snippy letters to editors whenever someone suggests that the PC gaming market ain't quite what it used to be. If I see that an organization's goal is to "raise awareness" about a subject, my mind mentally translates the words into "wank off." We're a pretty info-intense society. We're about as aware as we need (or choose) to be.

It's always nice to have a single, one-stop shop for market and demographic info, but most of the PCGA's other goals seem either dubious or redundant. It's nice to talk about creating forums for developers, but don't we already have both the GDC and the IGF? It sounds very concrete to say the organization can help "simplify hardware specifications and speed the introduction of new technologies," but both of these goals are beyond the control of any trade group, not to mention its claims about tackling piracy, cheating, and security. If the PCGA has some supersecret solutions to these problems which have thus far eluded the industry, maybe it can share them.

Specifics, please.

Thomas L. McDonald has been covering games for 17 years. He is Editor-at-Large of Games Magazine.

Microsoft Cuts Vista Pricing

With Vista adoption still falling short of Microsoft's expectations, the company is hoping price cuts will spur better sales of the OS. In the United States, the price of the full version of Windows Vista Ultimate will drop from $399 to $319, while the "upgrade" version of Ultimate will drop from $259 to $219; the price for the upgrade version of Vista Home Premium will be reduced to $129 from $159.

Nvidia Goes DDR3 with New nForce 790i

Native PCI-E 2.0 and official 1,600MHz FSB support among new features

Nvidia has officially boarded the DDR3 train with the release of its nForce 790i chipset. An update to the recently released nForce 780i, the 790i includes a wealth of new features.

Among the new features is native support for PCI-Express 2.0. While the 780i used a secondary nForce 200 controller chip to add PCI-E 2.0 support to what was essentially the nForce 680i's north bridge, the 790i will go straight to the GPU at PCI-E 2.0 speeds.

Although performance benefits aren't known, the elimination of the additional chip should help streamline motherboard designs. The 790i will also work with Intel's upcoming 1,600MHz front-side bus processor—the 780i does not.

Another big change the 790i offers is the inclusion of a DDR3 memory controller. DDR3 RAM prices remain high, but clock speeds are almost double that of DDR2. Motherboards using the new chipset should be available by the time you read this.

Colleges to Police P2P?

Congress passes a controversial education bill

When the College Opportunity and Affordability Act (COAA) first made its way through the House Education and Labor Committee back in November 2007, its inclusion of anti-piracy measures raised eyebrows. The bill, meant to improve access to higher education, required universities to fight P2P activity on campus in order to receive financial aid. Of course, MPAA and RIAA lobbyists were behind that provision, brandishing a since-debunked study that found file-sharing among college students responsible for 44 percent of movie studio "losses." Despite news of that study's grossly inflated numbers, the final bill, which was overwhelmingly passed by Congress in February, still tasks universities with filtering P2P networks and providing a legal alternative to file-swapping, although there are no stated consequences for not obliging.

MS Sued over Vista Capable Logo

Consumers were misled into thinking integrated chipsets supported Windows Vista

A class-action lawsuit alleging that Microsoft deceived consumers has been given the green light by a federal court.

The suit, filed in Seattle, WA, alleges that Microsoft's "Vista Capable" logo program—used on machines prior to the release of the OS—was intentionally misleading. Many of the PCs that sported the badge used Intel's anemic 915 integrated graphics chipset, which was incapable of running Vista's 3D Aero interface. Federal judge Marsha Pechman allowed the case to proceed based on a "price inflation" theory that consumers were tricked into paying more for machines with the "Vista Capable" badge.

How bad were the Vista Capable machines? One email from a Microsoft employee said "even a piece of junk will qualify."

Dell Ejects Proprietary Parts

Standardized PSU and motherboards will now be, um, standard

Dell is abandoning its much-criticized practice of using proprietary parts in its PCs. The company's next update to its XPS gaming PCs will use standard ATX parts through and through; according to Dell, the XPS lineup will do away with the proprietary motherboards, power supplies, and power cables that had previously been used.

The company had long argued that its proprietary parts were better engineered than parts that followed the ATX standard. For example, the company had used power supplies that looked like ATX parts but were wired differently because, the company stated, its engineers believed the standard spec was flawed. When users tried to replace one of these PSUs with a standard ATX model, they were often greeted with smoke. That's all water under the bridge now, says Dell. The company's mission with its new gaming machines is to follow industry specs wherever possible.

Dell's new XPS series machines represent a new direction that should appeal to upgraders.

FUNSIZENEWS

GOOGLE HELPS HOMELESS

Google is partnering with the city of San Francisco to give every homeless person in that city a lifelong phone number and free voicemail. The project is meant to help homeless people pursue employment opportunities and health services by giving them a reliable contact number. If the program is successful in San Francisco, it could be rolled out in other cities.

STARBUCKS SERVES AT&T WI-FI

Beginning this spring, more than 7,000 Starbucks across the U.S. will offer AT&T Wi-Fi service. For existing AT&T broadband and U-verse customers, this means free Wi-Fi when visiting a Starbucks store. Starbucks cardholders will be eligible for two hours of free Wi-Fi per day at participating stores, and all other Starbucks customers will be able to purchase two-hour installments of Wi-Fi time for $3.99 or monthly access for $19.99.

CABLE CONUNDRUM

More than a month after as many as five undersea cables providing Internet service in and out of the Middle East were discovered damaged, the cause of the incidents is still shrouded in mystery. While reports have surfaced that the fifth cable was indeed the result of an accident, the crews on vessels sent to repair and investigate the other four cables were unable to determine how the damage occurred. Sami al-Murshed of the International Telecom Union has stated, "…we do not rule out a deliberate act of sabotage."

NATIONWIDE WIMAX BACK ON?

Clearwire and Sprint have apparently reconsidered their decision to abandon a joint WiMax venture. Last fall the two companies ceased work on a network build-out that would have brought wireless connectivity to even remote parts of the country. Now, with a recent infusion of cash (reported at $2 billion) from Intel—a major WiMax supporter—the partnership between the two service providers is back on.

DIGITAL CAMERAS

DSLR **vs.** Point-and-Shoot

Digital point-and-shoot cameras have come a long way since we last put a pocket wonder against a digital SLR (March 2005). The number of megapixels has increased, the noise has decreased, and even that annoying three-second shutter lag seems to be a thing of the past. To see just how a modern P&S stacks up against its burlier DSLR brethren, we pitted Canon's PowerShot SD950 IS against the company's Digital Rebel XTi. The PowerShot has a theoretical advantage with its 12MP sensor and built-in image stabilization. But do those qualities indeed make it as good as or better than the 10MP performance-oriented Rebel XTi? Let's find out.

BY GORDON **MAH UNG**

DSLR
Canon EOS Rebel XTi
$600, www.usa.canon.com

round 1 FORMFACTOR

There's just no comparison here. Even though Canon has put its consumer-focused DSLR on a Jenny Craig diet, slimming down the battery pack and making the body as compact as possible, you'll never be able to slip the Rebel XTi into a shirt pocket and walk into a concert the way you can with the PowerShot. That gives the PowerShot an advantage because you can't take that great picture if you don't have your camera. The size of the PowerShot means you'll likely carry it everywhere, whereas you'll think twice about toting around the Rebel XTi. Don't get us wrong, the Rebel XTi is about as unobtrusive as a digital SLR can be—but you'll always know it's there. The PowerShot, however, is small enough that you could secretly slip it into prison if you had to.

WINNER: POINT-AND-SHOOT

round 2 PRICE

The Rebel XTi is one of the most inexpensive DSLRs on the market, but with a street price of just under $600, including an OK starter lens, you'll be paying almost 45 percent more than the PowerShot's $340 street price. And that's assuming you buy the Rebel XTi with the cheapy zoom. If you want to step up to a faster-focusing lens that performs better in low light, prepare to spend hundreds or even thousands of dollars more. And while you're unlikely to spend more on the PowerShot beyond the initial memory card or case, a DSLR invites continual spending on a better flash unit or new lenses you just "have to have."

WINNER: POINT-AND-SHOOT

round 3

PERFORMANCE

The digital point-and-shoot is leaps and bounds better than its predecessors in this area. If you're still using a two- or three-year-old point-and-shoot, you'll be amazed by a modern model's improved autofocus speed and how little time it takes for the camera to take the picture after you've mashed the shutter release. Continuous-shooting times are also much improved over point-and-shoot bodies of yore. Unfortunately, even the cheapest DSLR roundly smokes this category with superior autofocus performance, start-up speed, continuous shooting, and AF tracking. While point-and-shoots have come a long way, there's still no comparison.

WINNER: DSLR

round 4

FLEXIBILITY

The DSLR's strength has always been in its ability to adapt to any picture-taking scenario. Need a fish-eye lens or a 1,200mm telephoto? The DSLR has you covered. With the DSLR's ability to quickly and easily accept a variety of lenses, you can get the shot you want the way you want it. The flexibility of a DSLR system, however, extends beyond the lens. It also accommodates a vast array of flash configurations and remote-firing options that just aren't possible with even the best point-and-shoot models. Still, a point-and-shoot does have one major advantage over a DSLR: video. Most point-and-shoots can produce YouTube-quality or better video. That's something no DSLR that we know of can do yet.

WINNER: DSLR

round 5

IMAGE QUALITY

Point-and-shoots have vastly improved in high-ISO performance. While a 400 ISO image taken on a point-and-shoot just three years ago was as noise-filled as a TV using rabbit ears, the PowerShot can take fairly competent shots at up to 1,600 ISO. The images are a bit overprocessed, but not bad—for a point-and-shoot. The Rebel XTi, however, produces incredibly noise-free images at 1,600 ISO. The point-and-shoot is also at a disadvantage if you're trying to create an image with selective focus, due to the relatively small size of its sensor. Finally, there's the matter of glass: Even the DSLR's bundled lens will normally outshoot a point-and-shoot's optics. And when you slap a nice lens on the DSLR… *fuggedaboudit.* To see a side-by-side image comparison, go to **http://tinyurl.com/2bs4wa**.

WINNER: DSLR

POINT-AND-SHOOT
Canon PowerShot SD950 IS Digital ELPH
$400, www.usa.canon.com

And the Winner Is...

There's an old saying in photography: It's not the camera, it's the photographer. In other words, don't count on the equipment to take better pictures, count on yourself.

Be that as it may, it's still far easier to produce better images with a DSLR than a point-and-shoot. From the low-noise, high-ISO performance, to the ability to create pleasing out-of-focus backgrounds, to the DSLR's flexibility with lenses and accessories, the performance and image quality from a DSLR are virtually guaranteed to exceed a point-and-shoot's. Granted, the point-and-shoot has the advantage if cost and size are your primary concerns—but it that's the case, why not just use the camera on your cellphone? You scoff, but we're probably not far off from that being a viable option.

The fact will remain, however, that if you want the best possible shots, you should just cowboy up and accept that you'll need to carry a DSLR. MPC

Our consumer advocate investigates...

✓BufferZone's Vista Delay ✓3B Tech's Drive Problem ✓Saitek's Phantom Copilot

WINSLOW, ***watchdog of the month***

WRONG TO TRUST TRUSTWARE?

I read in the February issue ("Security 2.0") that Trustware's BufferZone Pro would provide Vista support by the time the article was published. I purchased a one-year BufferZone Pro license only to discover that Vista support doesn't exist. I contacted Trustware's customer support and asked if the company would honor the one-year subscription once the Vista version was finally available. I have yet to get a response. This makes me very displeased since I put faith in the article. I know it's not your fault, but if it's still OK, I'd like to vent a bit and get a little pissed. A response would be nice from both ***Maximum PC*** *and Trustware.*

—Brian Starr

BufferZone's Vista support has been delayed a few months, but the company pledges that it will come out.

We'll use the Han/Lando rule and simply say, "It's not our fault." Just kidding. While the article did preface the statement about Trustware's Vista plans with "If true to its word…", we are sorry that some readers were lead astray. The magazine must occasionally report estimates from software and hardware companies when it comes to pricing and availability, and as you might expect, that information is sometimes wrong—as it was here.

So what's the story with Trustware? The Dog pinged the company to see what happened to the promised Vista support. A spokesman told the Dog that, due to additional quality assurance tests, the company felt compelled to delay Vista support until the end of the second quarter of 2008. In other words, it's expected to be out by June. The official apologized but assured the Dog that Vista support is "definitely" coming. He said the company is offering full refunds to folks who purchased the product with the intent of running it under Windows Vista. Reader Brian Starr opted for a refund, but he did tell Trustware he plans to purchase BufferZone once Vista support is offered.

WHEN IS 'NEW' NOT?

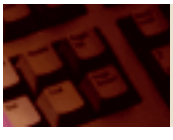
Last month I purchased a 250GB EIDE Western Digital hard drive from 3BTech.net. The drive, however, posted failed-read errors and reformats, so after a week, I decided to return it. I set up an RMA with the company and requested an exchange. Before I sent off the drive, I ran Hard Drive Inspector on it to look for issues. This is when I found that the drive had 5,111 hours (212 days) worth of run time on it. This was obviously not a new drive. I included a printout of the report and a request for a full refund when I sent the drive back. Two weeks later I inquired about the refund and was told that a replacement drive was on the way because that's what I initially requested when the RMA was created.

I figured that if the new drive was truly new, I would not concern myself with a refund. And how could 3B Tech send me another used drive after I discovered the first one? I received the drive, ran Hard Drive Inspector on it, and discovered 4,924 hours (205 days) of use on it. I emailed the company requesting that I be reimbursed for shipping and given a full refund. The next day I received a response that my request would be granted. I believe I will receive my refund, but a company that can send old hard drives as new should not be trusted. I will never buy from 3B Tech again. I would recommend that anyone buying a reportedly new or OEM hard drive check the SMART data to see how many hours of use the drive has on it.

—Vance Sykes

This isn't 3B Tech's first problem with hard-drive misinformation. Reader Lynn Means reported purchasing a new drive from 3B Tech and receiving a drive that was actually remanufactured. After she returned the drive, the company refunded her just 75 percent of what she had paid for the drive, added a restocking

After testing his "new" drive, a reader found it had already logged nearly 5,000 hours of up time.



Got a bone to pick with a vendor? Been spiked by a fly-by-night operation? Sic the Dog on them by writing **watchdog@maximumpc.com.** The Dog promises to answer as many letters as possible, but only has four paws to work with.

fee, and stiffed her for shipping both ways. Sounds pretty low.

The Dog tried to reach 3B Tech numerous times for its side of the story but never received a response. That's no surprise, as the company has a pretty lousy reputation. On ResellerRatings.com, consumers give the company a rating of 5 out of 10, with several people making complaints that echo those of Vance and Lynn: bad drives out of the box, restocking fees for defective merchandise, and apparently used items being sold as new. The Better Business Bureau also gives 3B Tech a thumbs down and has logged about 27 complaints about the company in the last three years.

Since 3B Tech did not respond to interview requests, the Dog recommends that readers steer clear of the company. Readers interested in seeing how many hours have been logged on their drives should give Altrix's Hard Drive Inspector a spin. It's available as a fully featured trial at www.altrixsoft.com.

YOKE ON MY FACE

*On the recommendation of **Maximum PC**, (February 2008) I bought a full-blown Saitek Pro Flight Yoke System to play flight-sim games. But I can't get the game to stay in virtual cockpit view when using the controller. The game switches views on me automatically, going from virtual cockpit view to an external view, then to a side view, then to a rigid cockpit view, then back to the virtual cockpit view. This can be quite frustrating when trying to take off and land.*

After talking to Saitek, it was determined that the system was emitting phantom button presses, which was causing the changing views. The tech promised to send me a replacement unit as soon as possible and advised me not to return it to the vendor or Saitek through the normal RMA process.

After two months I decided to call the company. I don't remember the name of the tech I spoke with, but he was very rude. He told me not to send any more emails to Saitek and to be patient. I asked how long I should be patient, and he told me the company was shipping new units out between 30 and 60 days from when the company was notified of a problem. The tech also told me Saitek was experiencing problems with the new flight yoke systems and was trying to replace them as quickly as possible. Have you heard of this problem? Please don't growl, as I still put faith in your hardware recommendations, but this "fix" by Saitek has me a little angry about the way I have been treated after spending more than $300 for these controllers.

—Thomas DeKalb

The Dog contacted Saitek and was told by spokesperson Mark Starrett that "We did encounter an issue with the Pro Flight Yoke in the first production run last October. We determined that a small percentage of users encountered a 'phantom button press' phenomenon when using the Pro Flight Yoke on some PCs. The problem manifested as button signals going to Flight Simulator when no button is pressed. It was random, and the majority of users will never encounter the problem. Of course, this was still unacceptable to Saitek. We were able to modify the product's firmware to eliminate the problem, and all the yokes from subsequent production runs do not have this problem. PZ44 Pro Flight Yokes with serial number 491277 or later have revised firmware. All the product that Saitek received after November 12 and shipped after this date has the revised firmware. Since the revision, the issue appears to be eliminated. It is very important to Saitek to take care of the consumer in the fastest and most effective way possible. We ask that any consumer be directed to our technical support for assistance. Saitek will determine if the unit is defective and arrange for direct delivery of a replacement and pick up of the defective unit. We have set aside units for this purpose."

Mark said the company has also been in contact with Thomas and has taken care of his problem as well. Woof.

THE DEVIL IS IN THE DETAILS

Several readers chimed in to say they disagreed with the Dog's position that Symantec isn't at fault concerning the wording on packaging for its three-license antivirus and security bundles, which confused one reader (March 2008). The reader, who thought the licenses could be used individually at any time, said that it isn't clear that the licenses for all three begin with the initial installation, even though the box says, "… which begins upon initial installation."

Reader Dave Grenker, an attorney, said Symantec is in the wrong. He explained, "While one reading could certainly be the one that Symantec claims to intend (i.e., that there is a single, unified service period for all PCs covered under the license), another reasonable reading of the language could be that there is a separate service period for each computer that begins on the initial installation on that computer. If the language said something clearer, such as "...during the service period, which begins upon initial installation on the first PC," then I would be more sympathetic to Symantec's argument." MPC

The Ultimate Guide to MOVIE DOWNLOAD SERVICES

Home-entertainment technology has lent new meaning to the phrase 'home box office,' but can any of the new on-demand Internet movie services really deliver the big-screen experience? We examine the top eight options to find out

BY MICHAEL BROWN & WILL SMITH

Widespread broadband Internet adoption, not to mention pervasive digital rights management technology, has convinced Hollywood studios that it's safe to make their best products available as digital downloads. And thanks to Windows Media Center and devices such as Apple TV and Media Center Extenders, including the Xbox 360, watching downloaded movies in your home theater no longer requires planting a PC in your entertainment center (although there's nothing to stop you from doing that anyway). In fact, you might not need a PC at all.

No fewer than eight movie-download companies have jumped into the opening that Hollywood has provided, all of which promise to deliver the latest films fresh from their runs in brick-and-mortar theaters—TV shows, too—over the Internet. Netflix eliminated late fees and runs to the video store, but these on-demand services eliminate the need to wait for a disc to arrive in your mailbox.

But we wanted to know how these newfangled services compare to existing technologies, including DVDs and Blu-ray discs and the on-demand offerings from cable and satellite TV providers. So we brought each of them into our home theaters, watched movies on our big (and small) screens, tested the hardware (when it was required), and streamed videos from our PCs to our TVs (when it was possible) to see who best competes with the silver screen.

ILLUSTRATION BY ADAM BENTON

DOWNLOAD
OK
1
2 abc
3 def
4 ghi
5 jkl
6 mno
7 pqrs
8 tuv
9 wxyz
0
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CHN

BUYERS GUIDE

What to Know Before Logging On

Downloading movies and TV shows is a very different experience than renting or buying a disc

YOUR INTERNET CONNECTION

Maximum PC readers don't need to be told that downloading movies and TV shows just ain't gonna happen with a dial-up connection—this is a job for broadband: You'll want DSL service with a download speed of at *least* 800Kb/s for standard-definition content; the faster your connection, the less time you'll wait before you can start watching. Given the choice between DSL and cable, we'd take cable; fiber is even better—just make sure your ISP won't throttle your connection if you start downloading a lot of content.

If you crave high-definition movies, you'll want a much faster connection. Most of the service providers covered in this story recommend connection speeds of 2Mb/s or faster. Upload speeds are not nearly as important, since you'll send very little data to these service providers.

IS HD AN OPTION?

Make sure your computer monitor or television can handle HD content before you pay extra to download it. HD content is typically delivered in 720p, 1080i, or 1080p resolution, with the "p" standing for "progressive scan" (all the horizontal lines are drawn in sequence: 1, 2, 3….) and the "i" meaning "interlaced" (the odd-numbered horizontal lines—1, 3, 5…—are drawn first, and then the even-numbered lines—2, 4, 6…—are drawn in the next frame). Many people can detect a flicker in an interlaced display, although a good HDTV will deinterlace content before displaying it.

Most large computer monitors (24 inches and up) can handle 1080p, although that's often not their native resolution. Only enhanced-definition and high-definition TVs can handle anything beyond 480i. You should also keep aspect ratio in mind: Nearly all HDTV content is presented with a native aspect ratio of 16:9, so you'll get the best experience from a display that has a native resolution of 1080p and a native aspect ratio of 16:9. Still, you probably won't notice any difference from a monitor that has a native resolution of 1920x1200 and an aspect ratio of 16:10.

WATCHING ON YOUR TV

The service providers reviewed here have adopted one of three business models: Download content to your PC and view it on your computer monitor; download content to your PC and either view it on your computer monitor or stream it to your TV using your wired or wireless (you'll need 802.11n) network and third-party hardware you've purchased; or download content to a set-top box that you've purchased and plugged into your TV or computer monitor.

If you're going to download high-resolution movies, make sure your display can handle it. We used ViewSonic's 42-inch N4285p LCD TV, which supports a maximum resolution of 1080p.

PAYING THE PIPER

While there's plenty of free amateur video to be found on the Internet, Hollywood expects to be paid. The services reviewed here operate on one or some combination of three revenue models: **subscription**, an all-you-can-eat plan that allows you to download and watch as much content as you'd like for a monthly fee; **rental**, a pay-per-download model that typically gives you 30 days to begin watching and a 24-hour viewing window once you've initiated playback; and **purchase**, the model that gives you the most flexibility (but far less flexibility than if you'd purchased a disc).

Service providers take very different approaches to how they implement these models, so be sure you understand the terms of the service being offered. CinemaNow and Vongo, for instance, both offer a subscription service, but CinemaNow's subscription offerings exclude most mainstream Hollywood releases.

TERMS OF SERVICE

We can't overstate the importance of knowing exactly what you're going to get when you do business with any of these service providers. Here's an overview of the questions you should ask, but we'll cover the answers in detail in each review and in our comparison chart on page 38: Is the content in high definition or standard definition? Do you need to buy extra hardware? Can you stream the content from your PC to your TV? Can you transfer the content to a portable player? If so, which devices are supported? You won't be able to burn rented content to a disc, but what about the TV shows and movies you buy? If your hard drive craps out or your download becomes corrupted, can you re-download content you've purchased?

DEPTH OF CATALOG

Don't assume all these services have the same movies and TV shows on tap. Each company negotiates independent deals with the Hollywood studios that control the bulk of the top-shelf content. We'll grade each provider's catalog in our individual reviews, based on the availability of new releases, depth of their catalog, and their collection of cult classics (we've posted our complete findings at **http://tinyurl.com/yp7w8u**). We'll award extra points for high-def content.

Amazon Unbox

No high definition, but tons of titles and a cheap-'n'-easy way to get them on your TV

If you're like us, you've bought a lot of traditional media, be it DVDs, CDs, or—gasp!—books, from Amazon.com over the years yet have downloaded little or no content from its digital stores. After spending some time with Unbox—Amazon's relatively new movie and TV download service—we're about ready to start using it regularly. With a broad selection of inexpensive content and an easy and cheap way to get Unbox content to your living room, we initially thought this would be the service to beat—despite a complete lack of HD content.

One of Unbox's strengths is its tight integration with TiVo. You can queue movies for download to your TiVo from any PC.

Rental prices range from $3 to $4; purchases range from less than $10 to around $15. As with the other services, we wouldn't recommend purchasing downloadable movies—given the usage restrictions—but Amazon does make some allowances to fair use: Your purchase lets you download a TiVo-friendly file, a PC-friendly file, and a file that's optimized for PlaysForSure portable players. If you're browsing the web interface, there's even a handy chart on every page that tells you the aspect ratio, audio format, and file size for each of the different formats. We'd rather just buy an unencumbered DVD, but this is among the most consumer-friendly services we tested.

Unbox's PC software is unremarkable and a little buggy. It handles the file downloads and playback for both PCs and mobile devices. As with all the other services we examined, it operates on a progressive-download model that enables you to begin watching the movie while the download is in progress (as soon as it grabs enough data to fill its buffer). Unbox's integration with TiVo, however, sets it apart from the competition. Using any network-connected Series2 or Series3 TiVo (Series2 boxes can be found for around $100), you can watch rented or purchased movies on your big-screen TV. (But you'll have to wait for the entire file to be downloaded first; progressive download isn't available on the TiVo.)

You can also purchase content directly from your TiVo using the remote. The TiVo ordering interface isn't bad, but we prefer the extra information Amazon provides through the web browser. Once you make your purchase, you can choose to start downloading to your PC or send the file to your TiVo. We'd like to see support for high-definition content, but Amazon needs to switch to a more efficient codec before that will work—even standard-def movies are larger than 2GB.

The content library is impressive, with good coverage in new releases as well as a decent number of classic titles and cult classics; the price is right, too. We're fond of Unbox, but it's certainly not perfect. The service uses WMV, which leaves a lot to be desired in the image-quality department. The video we downloaded was decent but a bit soft, similar to that of the other WMV-powered services we tested and clearly inferior to the quality of video we downloaded from the iTunes Store, which was itself inferior to DVDs.

Still, we wouldn't say the video quality from Unbox was unacceptable, and combined with its easy method for getting content to the living room, support for portable devices, and reasonable pricing, we believe this is a fairly compelling service. The only thing missing is high-definition content using a better codec, which would make Unbox the clear winner here. We won't buy movies from Unbox anytime soon, but we're perfectly content renting from the service.

In addition to purchasing movies in your web browser using Amazon's standard web interface, you can also browse and purchase films from within the Unbox client.

VERDICT

7

- Movie rentals: $4
- Movie purchases: $10 to $15
- TV episodes: $2
- www.amazon.com/unbox

BitTorrent

Not ready for prime time

BitTorrent offers a plethora of free movies, including the 1969 lesbian love film The Tender Touch.

Most readers will be familiar with the BitTorrent peer-to-peer file-sharing protocol, which earned a somewhat notorious reputation as the tool of choice for people sharing large copyrighted files—particularly Hollywood movies—over the Internet. Bram Cohen, the programmer who originally created the protocol, has since founded BitTorrent, Inc. to exploit legal applications for his product. Movie downloads are one.

The beauty of the BitTorrent protocol is that no one person needs to bear the entire cost of hosting huge files, such as movies; instead, each existing recipient of the file supplies chunks of the data to newer recipients. That model works exceedingly well for those who need to host the file, but we're not quite sure how consumers paying for downloadable content benefit.

BitTorrent isn't integrated with Windows Media Center and the service doesn't offer a 10-foot user interface of its own, so it's best experienced on a desktop PC.

BitTorrent offers a broad mix of movies, TV shows, and other content for rent or purchase; it also offers some advertising-supported content. Purchased titles can be viewed on up to two computers, but rented titles can be viewed only on the PC they were originally downloaded to. Purchased movies can be burned to disc, but the disc can be played only on PCs that you've "activated" by signing into your BitTorrent account. BitTorrent does not permit purchased files to be transferred to portable devices, which we view as a major shortcoming.

What's worse is that the BitTorrent user interface is not integrated into either version of Windows Media Center, which makes it nearly impossible to browse the site's content from the comfort of your couch. In fact, the only way to search the service's library is to use the primitive tools on its website. This matters little if you're watching movies on your desktop PC, but it's a real pain if you're using a home-theater PC or streaming content to a Media Center Extender.

BitTorrent offers downloadable videos in both SD and HD and in WMV, H.264, and MPEG-4 formats, but the Hollywood offerings we sampled were all SD WMV files (with all the image-quality issues inherent to that format). We also found BitTorrent's prime movie library to be thinner than average, with only eight of our 25 new-release searches available for rent and nine available for sale. We found only two of our favorite cult films in the library: *Office Space* (for rent and for sale) and *Reservoir Dogs* (for sale only), but we did encounter some great horror films offered for *free*, which can be moved and burned to disc without restrictions.

It's definitely worth searching BitTorrent's library for unusual and free content, but the service has nothing to offer over the other services reviewed here.

VERDICT

4

Movie rentals: $3 to $4
Movie purchases: $10 to $20
TV episodes: $2
www.bittorrent.com

CONSPICUOUSLY MISSING

Netflix offers a movie streaming service, so why aren't we reviewing it alongside the others?

Netflix is legitimately awesome. For a few bucks a month, you get all the movies you want delivered straight to your door, and if you're committed to a monthly subscription plan costing $9 or more, you get access to Netflix's streaming service at no additional cost. This gives you instant access to hundreds of movies, ranging from direct-to-DVD releases such as *Superman: Doomsday* to cult classics like *A Boy and His Dog.*

But the service isn't perfect. Netflix relies on WMV, so its video quality suffers many of the same problems as the other WMV-based services we tested, namely, soft edges and resolution limited to 640x480. The service is included with the company's existing disc-rental subscription plans, so they don't offer newly released feature films (and they're contractually barred from streaming any older films that Vongo has the rights to).

You can use the freeware program MyNetFlix (the author accepts donations) to browse Netflix's offerings within Windows Media Center, and the program will even allow you to stream movies from another PC on your network using a Media Center Extender, but the software is Vista only. Netflix says it plans to build a set-top box in partnership with LG Electronics, but that announcement was way back during CES in January—the hardware is looking pretty vaporous right now.

Still, the convenience of having access to a large online catalog of back content, while simultaneously getting new releases on DVD—or even Blu-ray for the same price—renders Netflix a compelling solution in our eyes, even if you do have to wait for snail mail.

CinemaNow

Better than average, but that's not saying much

CinemaNow offers newly released movies on the same pay-per-view model that most of the other services here (with the exception of Vongo) use, but the service also sells a limited collection of movies that can be downloaded and burned to a DVD that can be played anywhere. CinemaNow's optional subscription service allows unlimited downloads, but these titles cannot be burned.

We can't imagine who would spend $30 per month (or pay just $100 for an entire year!) to watch the less-than-B movies that CinemaNow has on tap (*Addicted to Murder II: Tainted Blood, Planet of the Werewolf, Backyard Fight Clubs Volume III*). If the free content on YouPorn leaves you less than satisfied, on the other hand, membership in CinemaNow's Platinum Club also entitles you to unlimited access to AllAdultChannel.com.

The service's burn-to-DVD offerings range in price from $9 to $20, and we found many of Hollywood's better, if not exactly fresh, offerings (including *Reservoir Dogs, Requiem for a Dream,* and *Secretary*) selling for just $10. But why bother downloading movies and burning them to a disc when you can buy them factory-pressed for nearly the same price? Besides, most of the other films we found in this category are much less appealing than those cult faves (anyone in the mood for a Sinbad comedy special?). You can burn any other purchased movie to disc, but only as a backup data file—the discs will not play on standard DVD drives or players.

You can begin watching a movie downloaded from CinemaNow as soon as the Watch Now button is unghosted.

CinemaNow's rental model is much more typical, with pay-per-view movies going for between $2 and $4 (with new releases such as *Michael Clayton* and *Rendition* priced at the higher end of that range). The service had 16 of our top 25 new releases available for rent and 19 available for purchase. Customers have a 24-hour window to watch the movie within 30 days of downloading it. New releases available for purchase averaged $20 each. These titles cannot be burned to disc, but they can be viewed on up to three devices, including PlaysForSure handhelds.

As with the other services, CinemaNow was much lighter on classic content and had only three of the AFI's top 25 films available for rent (*Psycho, On the Waterfront,* and *To Kill a Mockingbird*). *Office Space* was the only one of our cult favorites available for rent; that and *Reservoir Dogs* were the only films on that list available for sale.

CinemaNow has some TV content for sale ($2 per episode), which can be transferred to portable devices but cannot be burned to disc. We found much of Fox TV's programming (including *24* and *The Family Guy*, but not *The Simpsons*), several of Showtime's original series (such as *Brotherhood* but not *Dexter*), and a handful of classic TV shows from the 1960s (including *Time Tunnel* and *I Spy*).

CinemaNow is integrated into both versions of Windows Media Center (XP and Vista) and content can be streamed to your TV using a Media Center Extender. The service has also been integrated into HP's MediaSmart LCD TVs, which have integrated network-streaming hardware. Movies and TV episodes are delivered in WMV format at the equivalent of standard definition (640x480 resolution). When we scaled video up on our home-theater PC, we noticed significant compression artifacts in shadows and dark skies, a problem we experienced with every WMV-based service except Vongo. As with most of the other services reviewed here, we judged video quality to be less than what you would get from a DVD.

We can't recommend CinemaNow's subscription service at any price, and its movie offerings are about the same as the rest of the field's (both in terms of price and the depth of its catalog). The service does earn points for supporting multiple PCs and portable devices and for being integrated into both versions of Windows Media Center. But the bar set by the competing services is pretty low.

CinemaNow is aggressive about servicing a broad variety of hardware, including portable devices and Media Center PCs, like this Asus Minuet.

VERDICT

6

Movie rentals: $2 to $4
Movie purchases: $9 to $20
TV episodes: $2
www.cinemanow.com

iTunes Store

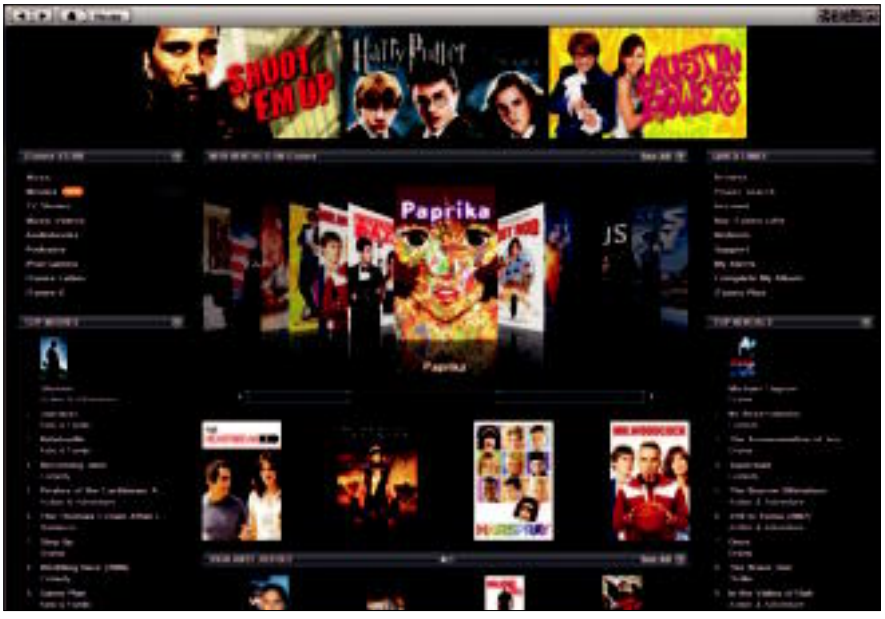
Apple led the downloadable music charge, but will it have the same mojo with movies?

Apple's tight connection with Disney (owner of the ABC television network and Pixar animation studio), its support for high-definition H.264 video, and a slick set-top box for playing your favorite TV shows and movies in your living room, render the iTunes Store an attractive proposition for home-theater enthusiasts. Too bad its video is limited to 720p.

But let's start with what we like. The video quality of content on the iTunes Store is superior to all the WMV services (although Vongo's quality is pretty good), which we mainly attribute to Apple's use of H.264. High-definition files look very good and, unlike many of the other services we tested, were noticeably superior to standard-definition DVD quality, although the lower-bit-rate downloads still fall noticeably short of the quality offered by Blu-ray discs.

Naturally, all this comes at a price: Standard-def movies rent for the going rate of $4, but HD rentals cost $5. The big problem with iTunes's current HD playback is that it works only with the Apple TV; you can't view high-def content via your PC. TV shows cost $2 per episode to own, but you'll get a better deal if you purchase an entire season of episodes. For people who watch only a few TV series each season, buying the downloads could be a better deal than paying for cable TV—if you don't mind the low resolution.

Watching downloaded video on your PC is all well and good, if you live in a dorm or have a 40-inch monitor. How does iTunes work when you want to watch your purchased or rented video on a TV or on the go? Reasonably well, as long as you purchase Apple gear. Rented movies work with any current-gen iPhone or iPod (5th-gen and older iPod users are out of luck) and follow the same basic rules as all the other services we've tested: You have 30 days to start watching and 24 hours to finish.



You can buy and rent movies and TV shows using iTunes on your PC, but if you want to watch in high def, you'll need an Apple TV.

If your PC isn't in your living room, you'll need to buy an Apple TV, which will enable you to stream music and photos as well as content you rent or purchase from iTunes. You can either set it up to make a straight copy of your iTunes library or stream the file in iTunes across your network. Copying media to the Apple TV means it will always be available whether or not your PC is powered up, but this will rapidly fill the device's small drive (40GB or 160GB). As you'd expect from an Apple product, the interface is slick and the purchasing experience is simple—it easily passes the "mom" test. Movie playback starts as soon as the buffer is sufficiently filled, and you can fast-forward, rewind, and skip to chapters using the included remote. Because the Apple TV uses purely passive cooling, it's important to make sure you leave plenty of room around it. And don't place anything on top of it—it doesn't like that. (See In the Lab on page 72 for more info on the Apple TV.)

The biggest problem with iTunes right now is its catalog. While there are tons of TV shows (nothing from NBC or Universal, but ABC, CBS, Fox, CW, and many cable channels are well represented), the movie selection is paltry and even new releases were showing up a week or more later than they were on the other services we tested (that might change as time goes on). And if the standard-definition content is sparse, the HD content is nearly nonexistent. Only seven titles on our list of 25 new releases were available for rent in HD. That's better than the two HD titles Vudu had to offer; on the other hand, Vudu had 18 of our 25 new releases available for rent, compared to iTunes's 10. Apple didn't have any HD titles available for purchase (Vudu had two)—not that we'd recommend that, given the current state of iTunes DRM.

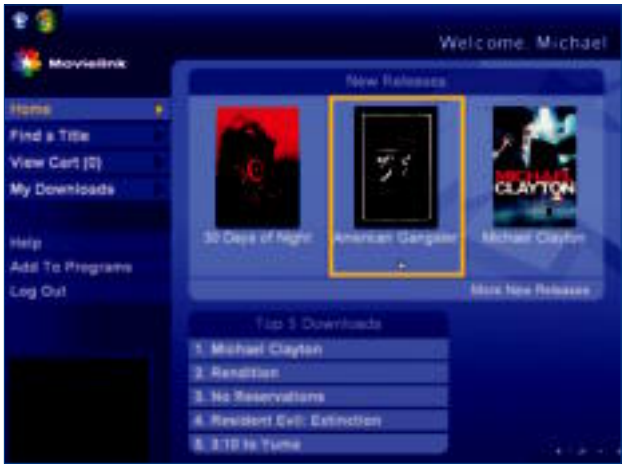
Our verdict may change with time, but for now, there simply aren't enough titles to consider the iTunes Store a serious rental competitor.

The Apple TV sure looks sexy, but it doesn't even include the basic cables you need to hook it up to a TV. Where's the 10-cent component-video cable, Apple?

VERDICT	
6	Hardware: $230 and up
	Movie rentals: $2 to $5
	Movie purchases: $10 to $15
	TV episodes: $2
	www.itunes.com

Movielink

The movie service that Blockbuster forgot



The sparse user interface places most of its emphasis on promoting new releases, but it's easy to navigate with either a remote or a mouse.

Movie-rental outfit Blockbuster Entertainment acquired movie-download service Movielink in August 2007, but the company seems to have lost interest in its latest asset. When we contacted Blockbuster's corporate communications department in preparation for this story, they couldn't be bothered to provide us with Movielink's phone number (which wasn't listed on either company's website). It's easy to see why.

The fact that Movielink is integrated into Windows Media Center gives it a leg up over BitTorrent, but there's nothing else about the service to recommend it over CinemaNow or any of the other services we tested. And if you're interested in watching rented or purchased movies on a handheld device, Movielink isn't for you—it supports only notebooks. Oh, and Movielink doesn't support Firefox either, unless you install the Firefox add-on IE Tab. Now that's just lazy.

Movielink's catalog is comparable to that of CinemaNow, Unbox, and Vudu. Movie rentals and TV episode prices are the same as the competition's ($2 and $4, respectively), but like the rest of the field, its movie purchase prices were $5 higher than Unbox across the board. The search engine in the Movielink Manager client enables you to locate films by category (including Coming Soon, Last Chance, and Award Winners, as well as by genre, director, actor, or keyword). Searches can be limited to rentals only, purchase only, or both. Movielink does have a cult cinema category, but *Office Space* was the only movie available from our list. It did have some other good catches, however, including Roger Corman's *Bucket of Blood*, David Cronenberg's *Videodrome*, and the blaxploitation classic *Foxy Brown*.

You can play downloaded content on up to three PCs, make backup copies on DVD (in their original format, which won't play on a standard DVD player), and stream from a PC to your TV using a Media Center Extender (using either Vista or Windows XP). All of Movielink's videos are in WMV format and in standard definition, so they suffer from many of the same scaling problems as the rest of the SD field.

The Movielink software client is integrated into both versions of Windows Media Center, so you can easily watch your rentals from the comfort of your couch, using an MCE-compatible remote.

VERDICT

5

- Movie rentals: $3 to $4
- Movie purchases: $8 to $20
- TV episodes: $2
- www.movielink.com

YESTERDAY'S REVOLUTION

Divx was supposed to change the movie rental scene—what happened?

In 1998, Circuit City and the Hollywood law firm of Ziffren, Brittenham, Branca and Fischer launched the Digital Video Express (Divx) format, a direct competitor to DVD. The idea was that you would rent movies on disposable discs that gave you 48 hours of viewing time once you started watching the movie (you also had to buy a Divx player and plug it into a phone jack). If you wanted to watch the movie beyond the 48 hours, you could extend the viewing time for another rental fee or permanently unlock the movie by buying it.

Divx ultimately failed due to consumer backlash: Environmentally conscious folks didn't like the idea of disposable DVDs clogging up landfills, and movie buffs didn't like the fact that Divx discs lacked the extra features—commentaries and "making of" segments—that they'd come to enjoy on DVDs.

The people had spoken. By mid-1999, Divx backers cancelled support for the format, destroyed all the unsold media, and prepared plans to discontinue the service entirely. When you think about it, the only difference between today's downloadable movie rentals and yesterday's Divx is the disposable disc—and 24 extra hours of viewing time.

Vongo

The all-you-can-eat movie buffet

Vongo's subscription business model puts it in a category all its own: The service's primary focus is to provide an all-you-can-eat smorgasbord of movies and other video content that can be downloaded to your PC for a $10 monthly fee. It doesn't offer any for-purchase content, and its TV offerings are nearly nonexistent.

Vongo is a division of Starz Entertainment, which has contracts with all the major Hollywood movie studios for semi-exclusive access to their films—but only after those movies have played out in theaters, the pay-per-view market, and as disc sales. Starz offers the same films on cable TV. A Vongo representative tells us these contracts cover about 40 percent of all Hollywood movies released in the last nine years. HBO is in a similar position, but that firm doesn't currently offer a download service.

When we compared Vongo's movie library to the rest of the field, we did indeed find that Vongo had many movies to offer that could not be rented online anywhere else. CinemaNow, Movielink, and others had them available for sale, but not for rent. And with Vongo, you can watch the content as often as you like—or for at least as long as Vongo has the right to offer it.

There is no free lunch, however, especially not in Hollywood: When we looked to Vongo for 25 of the latest releases, we found only one that was covered by the monthly subscription price and only one other that was available on a pay-per-view basis. Vongo also doesn't have much in the way of classic films (nothing from the AFI's top 25 list, for instance), and we didn't find any of our 10 cult classics in its listings. We did find some other gems, including *Dr. Strangelove, From Dusk Till Dawn*, and a host of low-brow offerings from Troma Entertainment (the studio that brought you *Toxic Avenger*).

Vongo movies can be streamed to your TV using any Windows Media Center Extender device, including the Linksys DMA2200.

Vongo has both a 10-foot user interface that's integrated into versions of Vista that include Windows Media Center and this close-up user interface for watching movies on your PC.

You'll need to download the Vongo client in order to browse the service's library, download content, and watch previews. The application has a search engine that enables you to find content by title, actor/director, category, format (standard or widescreen), MPAA/TV rating, language, and device (PC or portable). You can also search for subscription content, pay-per-view titles, or both.

Vongo's movie and (limited) TV offerings are delivered in the equivalent of standard definition (roughly 480i or 480p, dependent on your display) in WMV format. Video quality, as scaled by the Radeon 3850 videocard in our home-theater rig to our 42-inch ViewSonic N4285p TV, was very good. Being limited to standard definition isn't a major shortcoming now (since most of the movies in Vongo's library predate HD video anyway), but it will become a drawback as *today's* new releases are remastered for Blu-ray before making their way into Vongo's library.

Downloaded content can be streamed over a Windows Media Center Extender to a TV (assuming you have a version of Windows that includes Media Center), but Vongo's 10-foot user interface is also integrated into versions of Vista that include Windows Media Center. This means you can use a Media Center remote to control the Vongo client.

Like your movies on the go? Vongo's service can be used on as many as three devices simultaneously. One of these must be a PC, but the other two can be either PCs or Vongo-certified portable video players (including the Archos 605 WiFi, Creative Labs's Zen Vision: M, and Toshiba's Gigabeat V.)

If you can wait a year or so for movies to filter through the system and into the Starz library, $10 per month for all the movies you can watch is a great deal. We're not that patient, although we were reminded of a number of films that we'd forgotten to watch when they were new—and now they can't be rented from the other services.

VERDICT

7

Subscription: $10 per/mo
Movie rentals: $1 to $4
Movie purchases: N/A
TV episodes: $2
www.vongo.com

Vudu

We really want to like this service

Vudu delivers more HD content than any other service, but achieving that image quality requires you to purchase a $300 box that can't be truly integrated into the rest of your home network (meaning you can't stream the content downloaded to it from one room to another). And the company currently has HD licensing deals with only Lionsgate, Paramount, and Universal; the rest of its offerings are limited to standard definition.

Seduced by what we thought was terrific image quality, we spent a long honeymoon with the Vudu. The box is cool and extremely quiet (it had no issues with being tucked inside our entertainment center), the intuitive user interface is superior to any of the web-based alternatives, and the custom remote control is sheer genius. Vudu encodes the films it offers in a proprietary flavor of MPEG-4, and the box downloads films in the highest resolution your display will support (from 480i to 1080p). But since the Vudu's 1080p output is timed at 24 frames per second (to match the original film), the box had to drop down to 1080i in order to be compatible with our ViewSonic N4285p television (which can display 1080p, but only at a refresh rate of 30Hz or 60Hz).

But our newlywed bliss evaporated when we finally compared the downloaded HD versions of movies played on the Vudu box to the same films played on the Blu-ray drive in our home-theater PC: Vudu's versions offered significantly less detail. Video image quality was leagues beyond the soft-edged offerings on tap from the standard-definition services, but it wasn't nearly as good as what we saw on the disc.

The Vudu offers an attractive industrial design, but it stays cool enough that you can hide it in the depths of your entertainment center.

The Vudu has an excellent 10-foot interface, but its image quality is not much better than what you'd get with a cable or satellite set-top box.

Movie buffs should also bear in mind that movies encoded in high definition make for much larger files than what the other services have to offer. Vudu, like all the other services reviewed here, uses a progressive download system, so you don't need to download the entire movie before you begin watching it. But if your broadband Internet connection is 1.5Mb/s or slower, you will experience a significant delay—it could be an hour or more—before you've grabbed enough of the file to start. Vudu recommends having at least a 2Mb/s connection for standard-definition movies and a 4Mb/s connection for HD content.

Vudu offers movies for rent and purchase and TV shows for purchase. The service operates on a pay-as-you-go basis, but your credit card is billed in $20, $50, or $100 increments, as opposed to the per-transaction basis that the other services operate on. Movies downloaded to the Vudu's 250GB hard drive are stuck there; they can't be burned to disc (even for backup purposes), streamed across a network using a Media Center Extender, or transferred to a portable device. Vudu tells us its customers *will* be able to re-download purchased movies in the event of a hard-drive failure or other catastrophe.

Vudu's back catalog listed three of the AFI's top 25 movies for sale (*Lawrence of Arabia, Psycho, and Chinatown*), but it didn't offer any of them for rent. *Reservoir Dogs* (available for $10) was the only movie on our list of cult classics we could find for sale or rent.

At press time, the Vudu box was about $50 cheaper than the least-expensive Blu-ray drive and about half the price of a Blu-ray-equipped DIY home-theater rig, but is the instant gratification of watching a movie without having to go to the store (and hoping it's in stock) or waiting for it to show up from Netflix (with the same caveat) worth knowing that the image quality is worse than what you would get from a disc? We're not so sure the trade-off is worthwhile.

VERDICT	
7	Hardware: $300
	Movie rentals: $4 to $6
	Movie purchases: $10 to $20
	TV episodes: $2
	www.vudu.com

Xbox Live Marketplace

A gaming box and high-def movie-download device in one

It turns out that Microsoft's Xbox 360 is good for more than just playing games and streaming the occasional transcoded video file. Indeed, the game console can also be a source of movie and TV-episode downloads using Microsoft's online store, Xbox 360 Marketplace.

Unlike most of the other services we tested, Marketplace doesn't have a PC component. You rent movies using the Xbox's interface and the videos are downloaded directly to the Xbox's hard drive, where all the standard rules apply: You have 30 days to begin viewing and 24 hours to finish once you start. Of course, you'll need a network-connected, hard drive-equipped Xbox 360 to play. And you should know that the browsing interface uses the Xbox's standard design, which isn't exactly "mom" friendly. TV content is for purchase only and typically costs $2 per episode. Each network's key programming—think *Lost* and *CSI*—is available in high def for an extra buck but don't expect to see much from NBC here.

There isn't a massive library of back content available—the service featured fewer than 400 movies as we went to press. In our catalog tests, Marketplace fared OK in the new-releases department, offering the same titles you'd have to fight over at the video store. It didn't fare as well with classic and cult titles, but the good news is that much of the content for sale is also available in high definition. Like the other services that use WMV technology, videos rented from Marketplace suffer from the soft edges and large file sizes common to the codec. Standard-def movies look slightly worse than traditional DVDs, and the high-def content is noticeably inferior to Blu-ray.

Xbox Marketplace's interface is a tad clunky; it's designed for both standard- and high-definition screens.

For whatever insane reason, Microsoft chose to base the payment scheme for Marketplace around Microsoft Points, which have an extremely confusing conversion scheme. One dollar buys you 80 points, and each movie rental costs 360 points for standard-definition files and 480 points for high definition. For folks who have trouble with math, SD movies cost $4.50, while HD films cost $6. That makes SD movies on Xbox Live Marketplace pricier than the competition, but HD content is on par with Vudu's prices for 1080p content. What's more annoying is that you can't buy just the number of points that you need. Instead, you have to buy points in multiples of $5. So, to rent a movie for $6, you need to buy at least $10 worth of points. Lame. Points are tied to your Xbox Gamertag. Assuming you have the points to make the purchase, click the purchase button and the video will start downloading. As soon as the Xbox has sufficiently filled its buffer, the content will begin playing.

Like the other WMV-powered services, Marketplace could use a codec refresh. Despite the outdated codec, this is one of the few services that actually delivers HD content. We'd also like to be able to play downloaded content on portable devices and our PCs. That just seems like a natural option, especially given the rich ecosystem that Microsoft has built for media playback. Finally, we'd really like to see a lot more content on the service. Three hundred movies and change just isn't enough for serious movie buffs.

The only way to play videos from the Xbox Marketplace is with your Xbox 360; any hard-drive-equipped 360 can download and play them.

VERDICT

6

Hardware: $350
Movie rentals: $4 to $6
Movie purchases: N/A
TV episodes: $2
www.xbox.com

	AMAZON UNBOX	BITTORRENT	CINEMANOW	ITUNES	MOVIELINK	VONGO	VUDU	XBOX LIVE MARKET-PLACE
BUSINESS MODEL	Rent or Buy	Rent or Buy	Rent, Buy, or Subscription	Rent or Buy	Rent or Buy	Subscription and Rent	Rent or Buy	Rent
VIDEO-ENCODE FORMAT	WMV	WMV	WMV	MPEG-4; H.264	WMV	WMV	MPEG-4	WMV
MONTHLY SUBSCRIPTION PRICE	N/A	N/A	$8 to $30 (optional)	N/A	N/A	$10	N/A	N/A
PRICE PER MOVIE RENTAL	$4	$3 to $4	$2 to $4	$3 to $5	$3 to $4	$1 to $4 (if not included in subscription)	$3 to $6	$3 to $6
TV EPISODE PURCHASE PRICE	$2	$2	$2	$2	$2	$2	$2	$2
MOVIE PURCHASE PRICE	$10 to $15	$10 to $20	$9 to $20	$10 to $15	$8 to $20	N/A	$10 to $20	N/A
HARDWARE REQUIRED	PC or TiVo	PC	PC	Apple TV	PC	PC	Vudu Movie Box	Xbox 360 w/hard drive
MEDIA CENTER EXTENDER COMPATIBLE?	No	Yes	Yes	No	Yes	Yes	No	Yes
RESOLUTIONS SUPPORTED	480p	Up to 1080p	480p	Up to 720p	480p	480p	Up to 1080p/24	720p
PORTABLE DEVICES SUPPORTED	PlaysForSure	iPod or iPhone	PlaysForSure	iPod or iPhone	None	PlaysForSure	None	None
BURN PURCHASED CONTENT TO DISC?	No	Yes, with restrictions	Yes (limited titles)	No	Yes, but only as a data file	No	No	No
VERDICT	7	4	6	6	5	7	7	6

The Closing Credits

Here's where we make sense of the whole downloading-service scene

This roundup is a study in compromises. All these services are superior to what the typical cable company has to offer—with Comcast serving as the definition of "typical." Each one is also better than what you'll get from satellite TV provider DirecTV, which has the same pay-per-view movies, but they're available only at certain times. The other major satellite service, Dish Network, recently began offering a genuine on-demand service on its DVR tuners equipped with Ethernet ports, but the future of that device is clouded by an ongoing lawsuit.

And that brings us back to the services in this roundup. BitTorrent has great technology, but there's nothing to recommend its legitimate movie-downloading service (although we did find some great old movies for free!). The service is a pain to browse from the couch, you can't transfer movies to portable devices, and BitTorrent's library was very light on new releases. We likewise recommend avoiding Movielink—at least until Blockbuster figures out what it's going to do with the service.

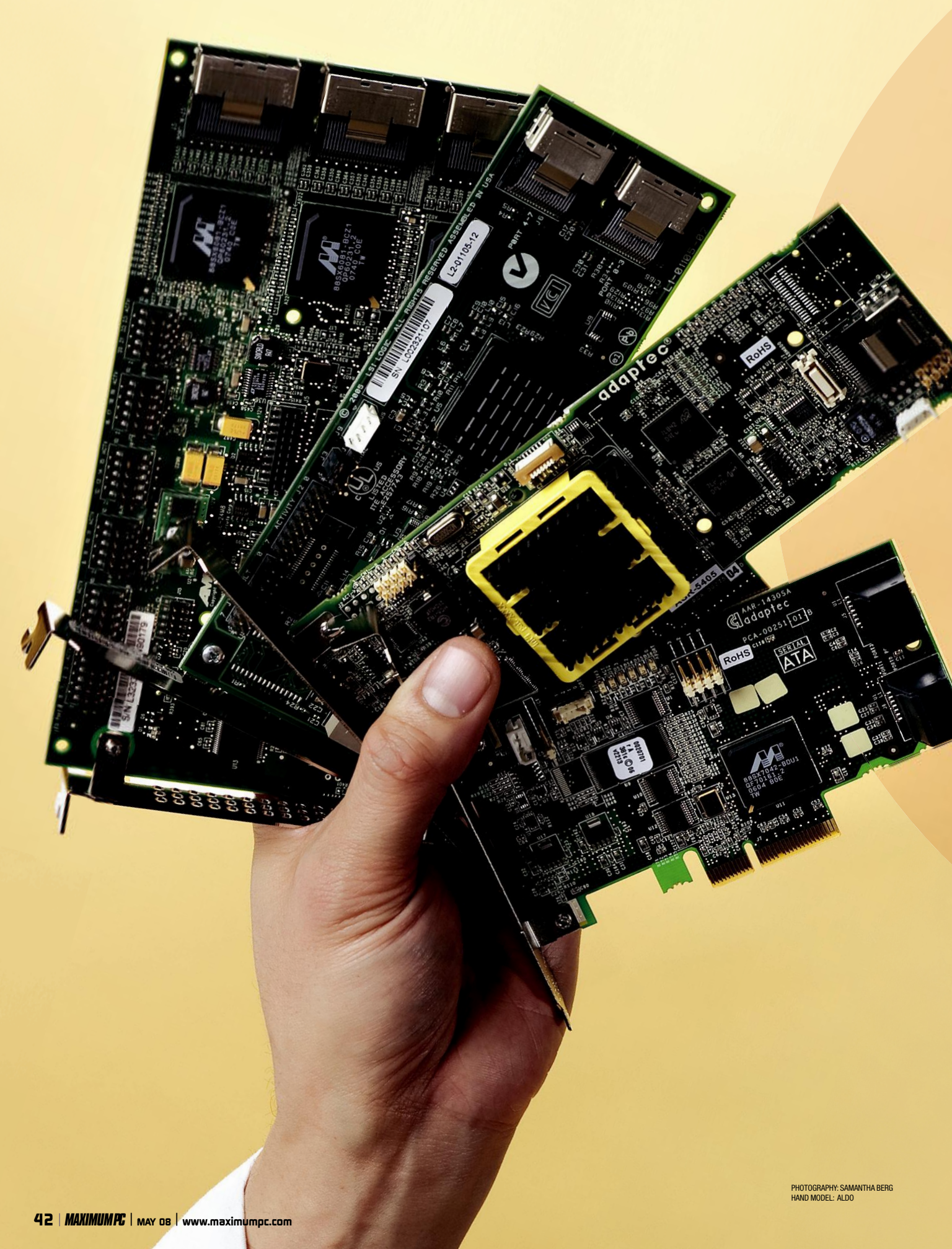
If you want to rent the latest films and buy TV episodes that can be transferred to a portable device, CinemaNow, Amazon's Unbox, and Apple's iTunes are your best bet (iTunes if you own an iPod and CinemaNow and Unbox if you own a PlaysForSure device). We can't recommend CinemaNow's subscription offerings, however, unless you want access to its adult-film library.

If you demand high definition, Vudu has the best solution—provided the movie you want is available in HD. Vudu's image quality is very good, but its SD mode is no better than what you'd get from your cable or satellite provider's set-top box—and its HD content isn't nearly as eye popping as what you'd get from a Blu-ray disc. You also need to take the cost of the hardware into account and the fact that you can't stream the video from one room to another, transfer it to any other device, or burn purchased content to disc.

Apple's iTunes with the Apple TV and Microsoft's Xbox Live Marketplace come in next, overall, but both services offer HD movies in only 720p—and both their movie catalogs fall short when it comes to the latest releases. They require new hardware, too (unless you already own an Xbox 360, that is). We really like the TiVo integration and user-friendly DRM that Amazon's Unbox service offers, but we wish the company had HD content. If we were to buy a downloadable SD movie, we'd get it from Amazon.

And that leaves us with Vongo. This subscription-only service was the first one we tried, and we were sure we wouldn't like it. Not because its image quality was any worse than the competition's—in fact, it offered the best WMV-encoded video of anybody—but because it doesn't offer HD or new releases for rent. But the more we thought about it, the more we liked the idea of watching as many movies as we want to on demand and on up to three devices (including non-iPod handhelds). It's almost like having a Netflix account, but with real streaming and portability options. If we could rent new releases and TV episodes, it would be the clear winner.

The biggest attraction all these services have in common is the ability to watch movies on demand (or almost on demand; if you have a slow Internet connection, you might as well go to the corner store). The only true no-compromises solution, however, is buying or renting old-fashioned discs. Buy Blu-ray discs if you want image quality or DVDs if portability is your main concern. MPC



PHOTOGRAPHY: SAMANTHA BERG
HAND MODEL: ALDO

ANOTHER MAXIMUMPC CHALLENGE

RAID CONTROLLERS COMPARED!

Motherboard vs. add-in card, host-based vs. discrete. What role does a RAID controller play in overall RAID performance?

BY DAVID MURPHY

In the November 2007 issue, we took an in-depth look at RAID—short for redundant array of inexpensive disks—and broke down the pros, cons, and most importantly, speeds of the various RAID permutations you would find on a typical multidrive setup. Here we'll examine the medium itself: the RAID controller, which tells the drives in a RAID setup how to interact. As you'll see, there are RAID controllers of differing types, technologies, and price points, and we want to learn whether these variations translate into performance differences. After all, even the fastest RAID configuration ultimately depends on the performance capabilities of its physical host.

A RAID array can be set up in one of two ways: You can use the controller that's built into your motherboard's chipset (if it includes one), which requires you to hook up your drives as normal and then edit a few BIOS settings, or purchase an external controller card, which boots its configuration menu before your operating system even loads.

Our mission is to test the performance of RAID setups using both low- and high-end RAID cards from five different manufacturers and compare those results against the performance of two common motherboard solutions. Once the dust settles, you'll know which RAID controller will give you top performance and exactly what features you get for your buck!

OUR TESTING METHODS

Every aspect of our experiment had to be considered in order to ensure meaningful results

The Controllers

To test the performance of motherboard-based RAID controllers we turned to Nvidia's nForce 680i chipset and Intel's P35 chipset. The former represents the typical testing environment we use for all our storage benchmarking and is a solid example of what you'd find on a high-end motherboard. The Intel-based board provides a fair representation of RAID performance on a midrange machine. Given Intel's dominance in the performance-computing market right now, we didn't bother testing an AMD-compatible motherboard. What's the point?

For our controller cards, we picked a combination of host-based and discrete models: With the former, the controller uses the rig's processor to handle RAID functionality (just as a motherboard chipset does), while discrete controllers remove your computer from the equation by supporting a low-powered processor right on the card. As you might expect, host-based controllers are cheaper than their discrete counterparts. Besides selecting controllers for both card types, we also sought to vary the price points in each category.

The Test Bed

All the testing, save that done on the MSI P35 Neo2-FR motherboard, was conducted using our standard storage benchmarking system: an Intel Q6700 on an EVGA nForce 680i motherboard, a single EVGA GeForce 8800 GTX videocard, and a single 500GB Western Digital Caviar SE16 hosting the Windows XP operating system. Each RAID test uses four Western Digital 150GB Raptor drives.

We elected to use two RAID configurations for benchmarking: RAID 0 (aka striped) and RAID 5. This allowed us to study the price/performance equation from two different mindsets: speed and redundancy. As we noted in our previous RAID feature, you won't find a faster storage configuration than RAID 0, in which the drives serve as one volume and your data is written and read across them concurrently. A RAID 5 setup balances the performance gains of striped arrays yet still offers a degree of data redundancy.

The Benchmarks

We're using the same standard suite of benchmarks we normally use for storage testing, with a few changes. We've downgraded our HD Tach program to version 3.0.1.0 to ensure we can run both read and write tests on the arrays. This synthetic benchmark bypasses any software on a machine to get right to the drives themselves, measuring the subject's maximum potential.

For a more real-world test, we're using PCMark05. We'll compare the scores from the program's subset tests—XP Startup, Application Loading, General Usage, Virus Scanning, and File Writing—as well as the overall score given to each test subject.

Finally, we've created our own real-world benchmark to further test these arrays under a typical usage scenario. We time how long it takes to write a 1080p multimedia slideshow to the array using Photodex's ProShow, based on files read from the array, while simultaneously using Adobe Premiere to convert a DVD rip on the array into an uncompressed AVI file. As these tasks also maximize our processor's usage, it allows us to discern the potential performance pitfalls of a card that uses said processor for its RAID calculations.

MEET THE TEST SUBJECTS

Our sample population of controllers covers every price point and feature set

HOST-BASED/ MOTHERBOARD

EVGA nForce 680i

This motherboard, chosen for the 2007 Maximum PC Dream Machine, comes with support for up to six SATA devices. But it's not just the potential size of the RAID that gets us going. The motherboard also provides a decent list of configurations to choose from: RAID 0, 1, 0+1, 5, and JBOD (just a bunch of disks). It's a surprisingly generous offering, given the fact that some of the add-in cards we're testing lack such variety.

Setting up the RAID itself is a breeze—you switch the SATA ports to RAID in the BIOS and then use a handy utility to select the drives, array type, and configuration options you want.

$300, www.evga.com

HOST-BASED/ MOTHERBOARD

MSI P35 Neo2-FR

MSI's P35 Neo2-FR is a respectable midrange motherboard that sports the flashin' new Intel P35 chipset with an ICH9R south bridge. We expect RAID performance with this chipset to rival that of EVGA's nForce platform, which is an older chipset stuffed onto a more high-end motherboard.

You get only five SATA ports on the P35 Neo2-FR: Four operate under the ICH9R chipset, with one running on an integrated Marvell 88SE6111 controller. This could have some bearing on performance when compared to the EVGA nForce 680i, which uses the south bridge for all six SATA ports.

$120, www.msicomputer.com

HOST-BASED

HighPoint RocketRAID 2300

HighPoint's entry-level RAID controller card is but a mere PCI Express x1 model—though in many ways, this makes it ideal for a typical motherboard setup. If you have the available connector on your motherboard, you won't have to burn one of your x8 or x16 slots for the card.

The host-based controller supports five different RAID levels: 0, 1, 5, 1+0, and JBOD. The controller features four ports, allowing you to connect up to four SATA drives using standard SATA cables.

We're mildly concerned that the controller's lack of any onboard memory might hurt the card's performance. But that's more an issue of the card's price point—you aren't going to see memory packed onto entry-level products.

$150, www.highpoint-tech.com

SPECS	
CONNECTION	PCI Express x1
RAID SUPPORT	0,1,5,1+0, JBOD
PROCESSOR	None
MEMORY	None
CONNECTION	Four SATA ports

DISCRETE

HighPoint RocketRAID 3510

One of the most expensive cards in HighPoint's line of RAID controllers, the RocketRAID 3510 trumps its lesser cousin, the RocketRAID 2300, with a few key features. You'll also find a multilane connector on the 3510 rather than a four-port SATA connector, although you get the same effect: The included breakaway cable supports the same number of drives—four.

More importantly, the 3510 controller comes with a built-in Intel IOP 81341 processor. The 800MHz proc pulls RAID actions off your rig's CPU. We expect this critical difference to shine in our more taxing RAID benchmarks, as we'll want every bit of our CPU's power going to the rendering test, not the RAID functionality.

The card also comes with 256MB of onboard DDR2 memory and is fashioned for a PCI Express x8 connection.

$370, www.highpoint-tech.com

SPECS	
CONNECTION	PCI Express x8
RAID SUPPORT	0,1,5,6,1+0, JBOD
PROCESSOR	800MHz
MEMORY	256MB DDR2
CONNECTION	One multilane connector

HOST-BASED

Adaptec 1430SA

Adaptec's entry-level 1430SA card supports only four RAID levels: 0, 1, 1+0, and JBOD. Critically missing is any support for a RAID 5 configuration—something all the other entry-level cards we're testing support. While this automatically disqualifies Adaptec's card from the RAID 5 portion of our comparative benchmarks, it doesn't necessarily bump the card to last place. The 1430SA might very well offer the best performance for its price in a RAID 0 configuration—which could be fine for folks interested in only RAID 0, or one of this card's other configs.

The PCI Express x4-based card comes with no extra frills. There's no onboard memory, nor is there a dedicated processor on the card to handle RAID requests. You can connect up to four SATA drives to the array via four standard SATA ports.

$125, www.adaptec.com

SPECS	
CONNECTION	PCI Express x4
RAID SUPPORT	0,1,1+0, JBOD
PROCESSOR	None
MEMORY	None
CONNECTION	Four SATA ports

DISCRETE

Adaptec 5405

If RAID controllers were cars, you'd find Adaptec's 5405 on a luxury lot. This little device comes packed with every feature, accessory, and upgrade an enthusiast could ask for.

The 5405 sports an onboard 1.2GHz dual-core processor to handle RAID functionality—that's more CPU than this article's author has on his laptop. We're expecting this, as well as the card's 256MB DDR2 cache, to spit out massive performance. But we're also curious to see how a card this stacked will benchmark

The 5405 supports an obscene number of RAID levels (0, 1, 1E, 5, 5EE, 6, 1+0, 50, and 60), making it the clear winner in the options category. The card uses a PCI Express x8 interface for the connection mechanism and a multilane port for SATA connections via a breakaway cable.

$425, www.adaptec.com

SPECS	
CONNECTION	PCI Express x8
RAID SUPPORT	0,1,1E, 5EE, 6, 1+0, 50, 60
PROCESSOR	1.2GHz dual core
MEMORY	256MB DDR2
CONNECTION	One multilane connector

DISCRETE

AMCC 3ware 9650SE-4LPML

The 9650SE-4LPML represents AMCC's entry-level RAID controller. It runs off a PCI Express x4 interface and supports a decent array of RAID configuration options: 0, 1, 5, 1+0, and JBOD.

The card boasts an onboard 266MHz PowerPC CPU, which does its part to keep your general computer operations separate from the RAID equation. However, we ask ourselves: Is 266MHz enough? In the grand scheme of things, especially given that our test machine runs a quad-core Q6700 processor, will such a relatively underpowered onboard chip have much of an impact on our benchmarks?

The controller also comes with 256MB of onboard DDR2 memory. SATA drives are connected via a single multilane port using an included breakaway cable.

$400, www.3ware.com

SPECS	
CONNECTION	PCI Express x4
RAID SUPPORT	0, 1, 5, 1+0, JBOD
PROCESSOR	266MHz
MEMORY	256MB DDR2
CONNECTION	One multilane connector

DISCRETE

AMCC 3ware 9650SE-24M8

The high-end version of AMCC's 9650SE RAID controller is a bit bulkier than the 4LPML card—and that's due to its extra connection ports. You get three multilane connectors on the large 24M8 card—for a maximum of 24 drives, with the appropriate breakaway cables, of course. The controller attaches to your motherboard using a PCI Express x8 connection.

This card expands upon the 4LPML's RAID options in a rather dramatic fashion by supporting 0, 1, 5, 6, 1+0, 50, and JBOD. That puts it nearly on par with Adaptec's 5405 controller.

We're mildly taken aback by this pricey card's paltry power potential, as the 24M8 runs a 266MHz processor, just like its far less expensive cousin. While this controller has double the RAM (512MB) of the 4LPML, we're skeptical that this will provide a huge performance boost.

$1,600, www.3ware.com

SPECS	
CONNECTION	PCI Express x8
RAID SUPPORT	0,1,5, 6,1+0, 50, JBOD
PROCESSOR	266MHz
MEMORY	512MB DDR2
CONNECTION	Three multilane connectors

HOST-BASED

LSI Logic MegaRAID SAS 8208ELP

On paper, LSI Logic's MegaRAID SAS 8208ELP controller looks like a respectable contender at the entry-level end of the RAID marketplace. The controller doesn't use an onboard processor to shuffle RAID duties from your CPU to the card, but it remains to be seen if this will have a demonstrable effect on next-generation computing systems.

The card *does* come with two separate multilane connectors for adding up to eight SATA devices with the breakaway cables that come included. You can then slap these drives into one of four RAID configurations: 0, 1, 5, or 1+0.

In practice, we found this PCI Express x4-based card to be quite frustrating, primarily because the drivers LSI shipped with the card flat-out didn't work. A quick run to LSI's website for updated drivers fixed the problem, but the fact remains: Out of the box, the 8208ELP does not function.

$315, www.lsi.com

SPECS	
CONNECTION	PCI Express x4
RAID SUPPORT	0,1, 5,1+0
PROCESSOR	None
MEMORY	None
CONNECTION	Two multilane connectors

DISCRETE

LSI Logic MegaRAID SAS 8888ELP

Thankfully, the 8888ELP works straight out of the box with the drivers LSI provides. As well it should—this is the company's high-end RAID product, designed as a discrete-performing controller for handling RAID 1, 5, 6, 1+0, 50, and 60 arrays. The controller itself comes with the same two internal multilane connectors as the 8208ELP, with an additional two external connectors located on the rear of the card.

The 8888ELP attaches to your machine using a PCI Express x8 connector. The CPU itself chugs along at 500MHz. This, plus the controller's 256MB of DDR2 memory, should help the card hold its own in our RAID benchmark showdown. It will also give us an interesting comparison point: What's more important, a faster processor or more memory?

$945, www.lsi.com

SPECS	
CONNECTION	PCI Express x8
RAID SUPPORT	0,1, 5,6, 1+0, 50, 60
PROCESSOR	500MHz
MEMORY	256MHz
CONNECTION	Four multilane connectors

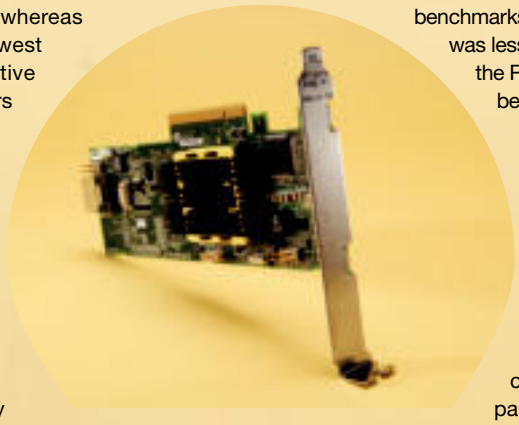
PERFORMANCE RESULTS

Yes, there's something to be said for add-in cards, but a costlier controller doesn't necessarily pay off

Host-Based Performance

It's only fair that we start our comparisons by looking at the host-based cards and motherboards. The relatively low cost of entry in these two categories makes this the natural starting point for a discussion about how controllers can impact the performance of a RAID. We had high hopes for our motherboards going into the slugfest. After all, these two products each represent pinnacles of performance: EVGA's nForce-based motherboard is a tried-and-true favorite in our Lab, whereas the MSI board sports one of Intel's newest chipsets. But even with all that respective might behind them, the two contenders were no match for Adaptec's 1430SA host-based add-in card. In two of the three official RAID 0 benchmarks, the 1430SA overtook the speediest of our motherboards, MSI's P35 Neo2-FR.

The only anomaly was a stunning upset by MSI's P35 Neo2-FR in our real-world encoding benchmark. We were surprised to see the board perform so dramatically better than any other contender in the host-based category. We have two possible explanations: Just considering the two motherboards, the EVGA model uses a single south bridge to control the functions of six SATA ports. The MSI board shuffles a five-port load across two separate onboard controllers. Then there's the simple possibility that this benchmark performs better on an Intel platform—we've seen it happen before and are apt to believe it to be the case this time, given the close performance of the two boards in the two other benchmarks.



Adaptec's 5405 controller dominated every critical benchmark in our testing process, save for one. And even then, we're talking about a mere 14-second difference.

Concerning RAID 5 performance, we must first note that the Adaptec 1430SA card was excluded due to its lack of support for RAID 5. It's a shame, too; HighPoint's RocketRAID 2300 squeaks out the performance win, but it's not an outright domination. Given how well the Adaptec card performed on our RAID 0 testing, we believe it would have stood a good chance of taking the crown in the RAID 5 benchmarks as well.

We found that both motherboards had a great deal of trouble with write performance in RAID 5. This killed their scores for all tests across the board, as both of our real-world benchmarks depend on a storage device's read *and* write capabilities. This leaves the RocketRAID 2300 as the default winner. In no way would we want to suffer through the abysmal write times of the two motherboards for any length of time.

It was interesting to see virtually no variance whatsoever in CPU usage, regardless of whether our array was being fielded by the motherboard or the host-based controller card. We remain unconvinced that a host-based controller's performance is hurt in a RAID setup merely because it relies on the CPU—at least, if you're running a multicore processor. The particulars of the card and the RAID configuration are what ultimately matter—as became apparent during the discrete portion of our testing.

Discrete Performance

If you're willing to spend the extra dough, the best discrete RAID controllers punish the competition to satisfyingly bloody results—but there are still duds to be found in this category. Both cards that used high-powered processors (800MHz or higher) destroyed the RAID 0 benchmark numbers of their host-based counterparts. While the ultimate winner was Adaptec's 5405 controller, HighPoint's RocketRAID 3510 achieved excellent results in our RAID 0 HD Tach and PCMark05 benchmarks. The real-world significance of the card's power was less apparent in our conversion benchmark, where the RocketRAID 3510 card trumped only the next-best contender by 11 seconds.

By contrast, Adaptec's 5405 card shined brightly on every individual test we put it to. The card topped all others in our HD Tach read test and utterly blew away the second-place controller by nearly 100MB/s on the write test. The 5405 pulled in awesome numbers in PCMark05 and also did well in our real-world benchmark. This ultimately amounted to a savings of about 50 seconds compared to the RocketRAID 2300, but compared to the nForce chipset, we're talking about a difference of six minutes.

We were most surprised to see the relatively lukewarm performance of the absurdly expensive 3ware 9650SE-24M8 controller in all of our benchmarks. If anything, this proves that you can't just toss money at a RAID controller and expect dynamite performance. For a $1,600 (MSRP) contribution to AMCC, you get RAID 0 performance that's no better than what AMCC's $400 model is capable of, or even than the $150 entry-level HighPoint RocketRAID 2300 controller. Yikes!

Adaptec's 5405 controller and HighPoint's RocketRAID 3510 traded shots during our RAID 5 testing. The former gave us the highest write speeds of any RAID card we tested in this showdown, leading to a squeaks-by-at-the-finish-line victory in our overall PCMark05 benchmark. However, the RocketRAID 3510 had consistently excellent performance across all read-related tests, overtaking Adaptec's 5405 controller by 14 seconds in our encoding benchmark.

The other cards we tested paled in comparison: 3ware's high-priced offerings gave us decent RAID 5 performance as compared to, say, a motherboard. They nevertheless showed little variation among the two price points. Adding insult to injury, both cards were topped by the host-based (and far cheaper) HighPoint RocketRAID 2300.

As for LSI's cards, well, we were amazed to see such an absolute nosedive from both the 8208ELP and 8888ELP controllers. Just to make sure we weren't flubbing something, we tested these cards in both RAID 0 and RAID 5 arrays on both of the motherboards mentioned in this feature. No dice. Both LSI cards turned in abysmal performances in RAID 5—in fact, their complete inability to perform to reasonable expectations constitutes a failure in our book. And while the 8888ELP functioned in RAID 0, its scores were average at best. We suspect this might be a driver issue of some sort, given the problems we had installing drivers to begin with on the 8208ELP card. However, we can't argue with the numbers.

THE BENCHMARKS

	EVGA NFORCE 680i	MSI P35 NEO 2 FR	HIGHPOINT ROCKETRAID 2300	HIGHPOINT ROCKETRAID 3510	ADAPTEC 1430SA	ADAPTEC 5405	AMCC 3WARE 9650SE-4LPML	AMCC 3WARE 3650SE-24M8	LSI LOGIC 8208ELP	LSI LOGIC 8888ELP
RAID 0										
STRIPE SIZE	Optimal	128KB	Not specified	Not specified	64KB	256KB	64KB	64KB	64KB	64KB
HD TACH READ (MB/S)	115.1	132.9	141.7	307.5	162.9	**308.2**	135.7	135.5	Fail	147.4
HD TACH WRITE (MB/S)	91.0	139.5	135.4	273.4	155.0	**359.7**	171.6	174.0	Fail	151.5
HD TACH BURST (MB/S)	227.1	249.2	191.2	**1,111.6**	247.2	747.5	218.3	218.3	Fail	234.4
HD TACH CPU USE	2%	2%	2%	3%	2%	4%	2%	1%	Fail	1%
PCMARK05 TOTAL SCORE	10,706	11,074	10,431	14,164	11,425	**16,514**	9,845	9,843	Fail	10,803
PREMIERE ENCODE (SEC)	908	**684**	1,152	847	882	782	858	838	Fail	884
PROSHOW ENCODE (SEC)	2,046	**1,502**	2,053	2,017	2,014	2,012	2,015	2,012	Fail	2,020
STARTUP TIME (SEC)	**39**	54	94	45	67	86	**39**	71	Fail	60
RAID 5										
STRIPE SIZE	Optimal	64 KB	Not specified	Not specified	n/a	256KB	64KB	64KB	64KB	64KB
HD TACH READ (MB/S)	157.5	158.6	144.2	**229.3**	n/a	145.8	135.4	133.6	Fail	Fail
HD TACH WRITE (MB/S)	21.1	13.3	140.7	171.1	n/a	**214.4**	116.5	122.1	Fail	Fail
HD TACH BURST (MB/S)	225.8	254.2	190.1	**1,139.2**	n/a	778.6	214.4	211.1	Fail	Fail
HD TACH CPU USE	3%	2%	2%	2%	n/a	2%	2%	2%	Fail	Fail
PCMARK05 TOTAL SCORE	4,558	4,010	11,051	13,994	n/a	**14,666**	7,392	7,396	Fail	Fail
PREMIERE ENCODE (SEC)	2,804	3,890	837	**767**	n/a	781	958	927	Fail	Fail
PROSHOW ENCODE (SEC)	1,753	1,255	2,114	**1,966**	n/a	2,004	2,023	2021	Fail	Fail
STARTUP TIME (SEC)	**39**	42	94	46	n/a	102	40	74	Fail	Fail

Best scores are bolded.

MOTHERBOARDS HOST-BASED CARDS DISCRETE CARDS

FINAL ANALYSIS

You have all the data, but we're taking it one step further: Here's what you should buy!

At the end of the day, the RAID equation is pretty simple. You've seen the numbers and the analysis, so let's take a big-picture approach before you rush out and plunk down money at your retailer of choice. The two motherboard-based RAID controllers we tested are perfectly acceptable solutions if you want a little speed boost in a RAID 0 environment, especially since it costs you nothing extra. In fact, depending on the motherboard you have, you may very well see a measurable difference between that and an entry-level host-based card.

If you're planning to run RAID 5, ignore everything we just said. You will want to have an add-in controller because if the two products we tested are any indication, motherboards just up and die when it comes to RAID 5 performance. You can pick up a host-based controller on the cheap and see a performance boost—provided the card supports RAID 5. In this respect, we have only the RocketRAID 2300 to go by, and based on our results, we think this relatively inexpensive host-based controller card earns its keep. But don't assume that you'll get comparable performance from a similarly spec'd/priced alternative. As this roundup has shown, RAID-controller performance varies wildly. You might luck out and score a decently performing product, but you might also select a card that just falls to pieces on your configuration of choice.

The surest way to avoid any pitfalls, especially if you're planning on testing out multiple RAID configurations, is to pick up a good discrete card. Don't go after the most expensive one you can find. As we've learned here, performance does not necessarily scale with price.

That said, we found great success using Adaptec's 5405 card in a RAID 0 environment. It was the fastest card in all of the benchmarks, and it offers substantial performance benefits over a similarly configured motherboard RAID environment. You can connect a bevy of hard drives to the card, and it comes with the most bountiful RAID options of any device here. If you don't mind an excruciatingly long initialization period, this card is perfect for those who want to dabble.

If you're just looking at RAID 5 performance, however, we have to tip our hat to HighPoint's RocketRAID 3510. It's less expensive than Adaptec's 5405, albeit also less feature-packed. But when it comes time to throw down, the card squeaks out the performance win over Adaptec's 5405. The 5405 beats the RocketRAID 3510 in RAID 5 write speeds. But it's still not enough to overtake the Rocket Raid's speedy reads.

The numbers say it all: We saw only a 14-second difference between the two cards in our real-world encoding test. If you can stomach that loss and want a card with a ton of RAID options, get Adaptec's 5405. If you just want RAID 5 performance and a card that can also hold its own in RAID 0, opt for the cheaper RocketRAID 3510.

But whatever you do, avoid LSI cards. Two out of two failures across two separate motherboards and a flurry of different hard drives does not a happy storage enthusiast make. Don't say we didn't warn you! MPC

MAXIMUM PC's

SIXTH ANNUAL SOFTY AWARDS

A big 'w00t' to this year's standout applications and utilities

BY THE MAXIMUM PC STAFF

Yes, it's that time of year again when we pay tribute to software. For without it, our badass rigs would have nothing to do to but look pretty. Indeed, it's the programs we run that show us what our machines are truly capable of. The challenge, of course, is in deciding *which* applications and utilities are most deserving of special honor, not to mention a coveted silver-esque statue.

There's no secret ballot, there's no peer-review process, and the public doesn't get to call in with their votes. The deciders in this contest are the *Maximum PC* editors. As always, the award candidates are culled from our own personal software libraries—we nominate only the programs we actually use on a regular basis because of their proven performance and reliability. As a group, we whittle down the entrants to the very best of the bunch—the nine exceptional apps and utilities featured here. What makes the whole process even more wonderful is that many of them are free!

Let's hand out some Softy Awards!

KeePass Password Safe

Why stress your noggin trying to remember your login?

These days, you can't get very far on a computer without amassing a bunch of user names and passwords (surely, you're not using the same password for every account you register!). KeePass Password Safe helps you keep all that information straight.

This free open-source program lets you manage all your passwords using an encrypted database that is kept safe from prying eyes by a single master password (the only one you need to remember!) and the one-two of AES and Twofish encryption. From the straightforward interface, to the random password generator, to the ability to easily create login scripts for the sites you visit, this app takes all the annoyance out of registered accounts. For ultra convenience keep the lightweight program on a USB key that you take with you anywhere.

Free, http://keepass.info/index.html

The Password Generator's multitude of options will satisfy even the most paranoid users.

Fraps

The gamer's ultimate benchmarking and multimedia companion!

It's hard not to love Fraps. We're just not sure which part of the popular program we love most. The fact is, this all-in-one application should be a mainstay of any gamer's desktop rig. For the frame-rate-oriented gamer, the program lets you overlay frame rate, so you can monitor performance in-game. Amateur directors love the program's movie-capturing feature, which lets you record what you're doing in a game—you can achieve better-than-HD quality! And rounding out the list of fine features is the program's screenshot function. We love being able to capture stills of our favorite game moments—frame rate included—with just the touch of a button!

$40, www.fraps.com

The movie-creation feature comes with plenty of options to address hard drive space and sound-quality concerns.

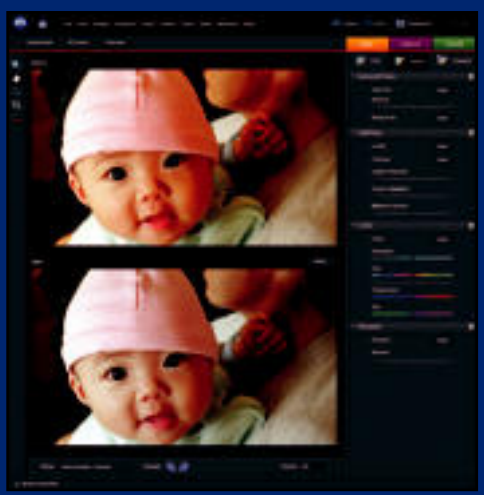
Adobe Photoshop Elements

Make your pictures better without the brain strain

Sometimes the ends do justify the means. Take Adobe's Photoshop Elements 6.0, for instance.

Normally, after we complete a software review, the app is uninstalled and the disc filed away. Not so with Photoshop Elements 6.0. We often find ourselves reaching for this program even over a full-fledged photo editor such as Photoshop CS3. It simply gets us the results we need with less time and hassle. That's a big win in our book because less time editing means more time shooting. And frankly, unless you're a Photoshop CS3 whiz, Elements may actually yield better results. And the app isn't lacking advanced functionality, either. You still get access to Adobe Camera RAW updates, for example—a major leg up over other newb-centric photo editors.

$100, www.adobe.com



Common editing chores, such as color-cast correction, are effortless with Elements 6.0.

SOFTY AWARDS

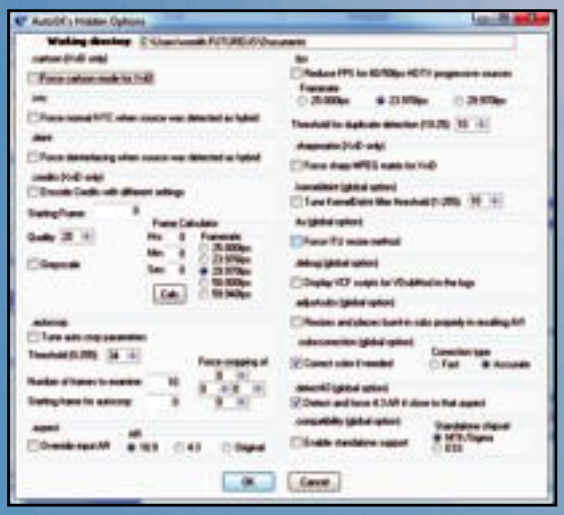
AutoGK

Ripping DVDs can be fast, easy, and free!

Ripping DVDs used to be a major hassle. It took ages and required pricey software—and at the end of three hours of work you may or may not have created a file that played properly. AutoGK (along with cheap multicore systems) has changed that.

AutoGK works its mojo by corralling a motley collection of utilities into a cohesive package. One app extracts the video from the VOB file, one syncs the audio with the video, and yet another recompresses the video down to a fraction of its original size. While this might seem complex, AutoGK makes it simple enough that any user can rip a disc. Still, hidden away in a secret menu (press Ctrl+F9 to access it) there's a whole host of power-user-friendly options just waiting to be tweaked. That's what the Softys are all about!

Free, www.autogk.me.uk



Quick DVD-to-DivX rips are great, but the power-user features are what really get us excited.

Favorites of the Future?

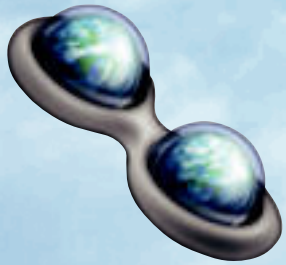
Will these three apps be top dogs when final versions are released?

UTORRENT

It's not that we're unhappy with the current version of uTorrent. The program has proven itself to be one of the top-notch apps in our downloading arsenal. Its scheduling and automated features make pulling files across the Internet a breeze, and the app makes nary a dent in our system resources.

Still, uTorrent can only get better with the coming upgrade to the BitTorrent protocol that runs underneath this amazing bit of software. BitTorrent developers are currently at work on a new encryption method to thwart the bandwidth throttling methods of a number of popular Internet service providers—Comcast included!

www.utorrent.com



TRILLIAN ASTRA

Long ago, Trillian was our favorite instant messaging client, until Pidgin displaced it. Now we think it might be time to revisit our earlier flame, given what we know of Trillian Astra and its IM-anywhere design. In addition to serving as a traditional desktop client for both Mac and PC platforms, Astra comes in a browser-friendly version that works anywhere. All your relevant info syncs across platforms and machines, so all you need to do is log in to Astra, and everything from your AIM, MSN, and Google Talk settings to your buddy icon will be there at the ready.

www.trillianastra.com

FIREFOX 3

We're anxiously awaiting the release of Firefox 3—currently in beta—for a number of reasons. The nascent browser includes some truly revolutionary features. For one, it supercharges the traditional bookmark paradigm, storing your bookmarks in an easily searchable database that's integrated with the rest of the browser's search features. Firefox 3's renderer seems to be speedier than it was in Firefox 2, too. Of course, all the improvements will be for naught if the development team can't squash the memory leaks that presently plague the Deuce. For now, we're hopeful.

www.firefox.com

SOFTY AWARDS

Auslogics Disk Defrag

Kiss Vista's crappy defragger goodbye!

What's worse than Apple not giving its users defragmentation support in OSX? The support in Windows Vista—clearly the slowest defragmentation application ever. We're talking since the Winchester hard drive was invented in 1956. It's as though the sectors are first squeezed through a quantum singularity and then beamed back and reassembled into a contiguous file by an angry shop of sector elves two steps away from a strike. For those of you who are mad as hell and unwilling to take it anymore, there's Auslogics Disk Defrag. Install this free defragger on your Vista OS and your blood pressure will drop instead of rise every time you defrag. XP users can benefit too—the app is also much faster than Window XP's freebie tool.

Free, www.auslogics.com

We don't actually know how long Vista's defrag takes because we always lose patience with it. With Disk Defrag it takes a mere 15 minutes.

DoubleTwist

An iTunes DRM stripper—and more!

So you got suckered into buying a bunch of DRM-shackled songs from iTunes—just so you could easily manage them on your iPod. But now you're ready to cut that leash so you can move to a more flexible player. Download DoubleTwist, give it access to your iTunes folder, and you won't lose that costly investment. The process occurs in real time, but it works.

But this ingenious—and free—program does a lot more than that. It can also automatically grab photos from your friends' Facebook profiles and synchronize them to your PC *and* your smartphone or MP3 player. What's more, you can also share those tunes (and pictures and videos, too) with all your Facebook friends. Cool!

Free, www.doubletwist.com

Facebook fiends will love the way DoubleTwist enables simple file sharing, but its DRM-stripping and sync features are pretty cool, too.

VMware Workstation 6

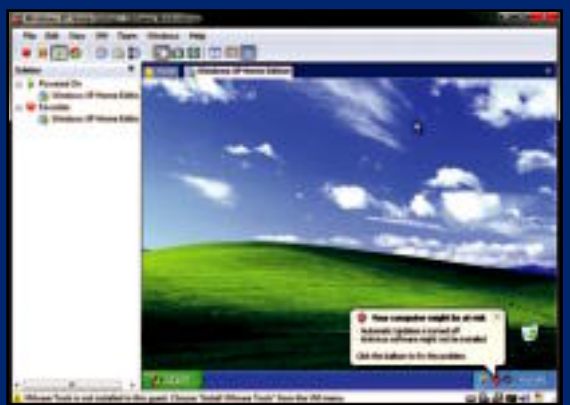
Host every OS you can think of on a single machine!

VMware workstation rocks due to its ability to let you run multiple operating systems on one PC. Install Linux, Solaris, and other desktop environments right alongside any Windows version—including those as far back as Windows 3.1 (provided you have the licenses, of course).

VMware's features trump those of a typical virtual machine environment. You can use the program to take snapshots and roll back your computer to a previous state, and you can take screenshots and videos of your system's activities, which comes in handy if you're trying to help someone with a troubleshooting issue.

While this app comes with a hefty price tag, we'd rather have a program that does everything than a lesser, cheaper alternative.

$190, www.vmware.com



Store profiles for any number of virtual machines, then switch among your collection of operating systems.

SOFTY AWARDS

Radiotracker

Build a massive MP3 library on the cheap

Someone, somewhere on the Internet is playing your favorite song right now. Radiotracker can not only find it but also automatically rip it to your hard drive.

If you don't mind compromising a smidgen on audio quality, Radiotracker offers an incredibly easy way to build a huge library of free—and legally acquired—digital music. The program works by monitoring Internet radio streams for the types of music you like. You can configure it to target specific genres (Americana, world, jazz, acid rock, etc.), particular artists, or even specific songs, and it will scan thousands of stations looking for just that.

When Radiotracker encounters songs that fit the profile you've created, it automatically records them to your hard drive in MP3 format—it even grabs ID3 tags and album artwork. The audio quality is limited to whatever bitrate the station is streaming at, but the tunes are free and legal!

$40 www.radiotracker.com

ThreatFire

Why waste time scanning for bad apps when you can simply block suspicious behavior instead?

Threatfire watches over your system to make sure malicious apps don't infect your PC.

Old-school antivirus and anti-spyware applications work in a very simple and predictable way. They scan every file you download and every app you install on your PC for malicious behavior. This worked really well back in the days when there were just four or five new threats every week. Today, hundreds of new threats surface regularly, and the old "scan for known baddies" approach simply doesn't cut it. That's where ThreatFire comes in.

Instead of scanning against a known database of viruses and malware, ThreatFire monitors applications for naughty behavior. When an app does something suspicious, ThreatFire locks it down and prompts the user to take action. Yes, we've been promised this type of protection before, but ThreatFire actually works, and it's less of a system hog than more traditional scanners. That's what we like to see!

Free, www.threatfire.com

THE 2008 LIFETIME ACHIEVEMENT AWARD

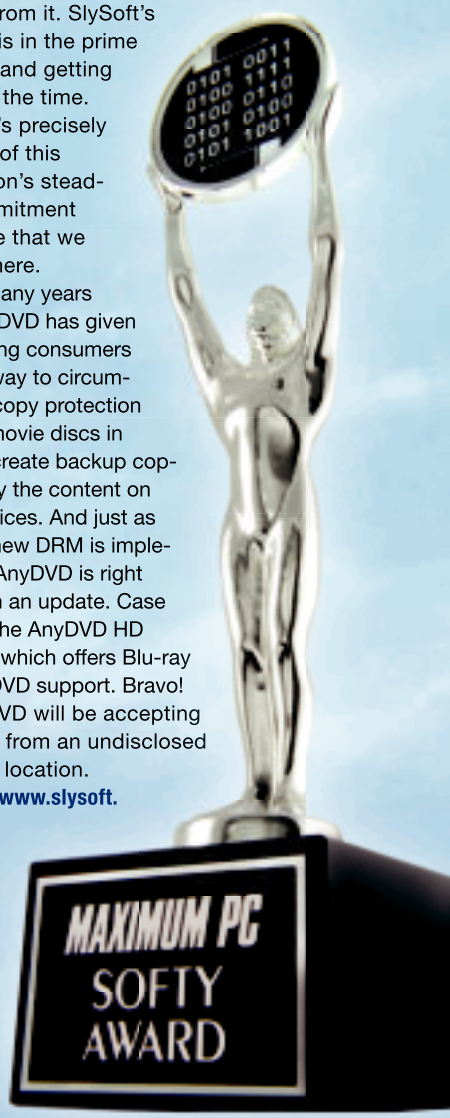
AnyDVD!

Don't confuse our Lifetime Achievement Award with those of other awards shows, where the recipient is nearing the end of his or her career and being tossed a sappy sympathy tribute. Far from it. SlySoft's AnyDVD is in the prime of its life and getting better all the time. In fact, it's precisely because of this application's steadfast commitment to service that we honor it here.

For many years now, AnyDVD has given law-abiding consumers an easy way to circumvent the copy protection on their movie discs in order to create backup copies or play the content on other devices. And just as soon as new DRM is implemented, AnyDVD is right there with an update. Case in point: the AnyDVD HD upgrade, which offers Blu-ray and HD DVD support. Bravo!

AnyDVD will be accepting its award from an undisclosed overseas location.

49 euros, www.slysoft.com MPC



Streamline and Customize Your Vista Installation

The free vLite application will help you save time—and gigabytes—by cutting the bloat from your Vista installation process

TIME 00:45 HOURS:MINUTES

Tired of Vista installation bloat? Looking for an easy way to set up an unattended install process? Wishing for a faster way to tweak your favorite settings after Vista is installed? There's an easy solution for all these scenarios, thanks to a little program called vLite.

VLite allows you to create a customized Windows Vista installation disc that contains only the features you need and leaves out all the drivers and components you don't use. The program also lets you perform an unattended install and configure a variety of post-installation tweaks.

Maybe you want to make your next Vista installation faster and easier by creating a one-button install disc. Maybe you want to put Vista on a diet. Hands-down, vLite is a great customization program that belongs in any power user's arsenal. However, while the process is straightforward, we recommend that you test your disc on a virtual machine, such as the free Virtual PC 2007 (**www.microsoft.com**), before doing a full install.

BY MARK EDWARD **SOPER**

WHAT YOU NEED

- **vLITE**
  Free, www.vlite.net
- **WINDOWS VISTA DVD UPGRADE OR FULL VERSION**
  $100-$400, www.microsoft.com
  (you can't use a restore DVD or partition with vLite)

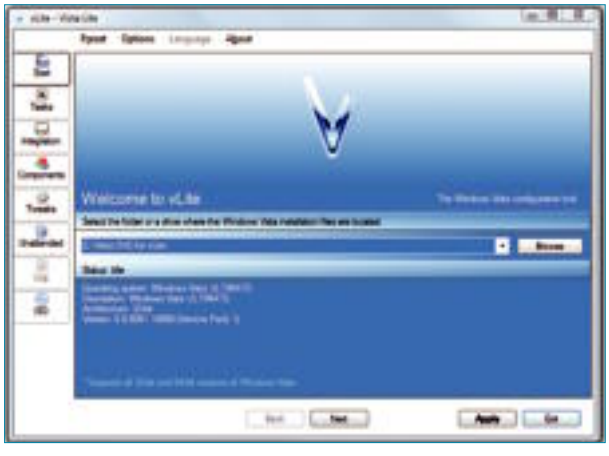
1 Get Started with vLite

VLite can be downloaded as either a 1.56MB installer or a leaner 1.43MB self-extracting archive. You need administrator-level access to run the application, so right-click the executable and select the Run as Administrator option—which is right below the Open command.

When vLite opens, the program prompts you to browse to the folder containing the Windows Vista installation files. Insert your Windows Vista DVD, click Browse, navigate to the optical drive, and click OK. Then click OK again on the Copy Files dialog and select a folder for storing the Vista installation files. Use the Make New Folder button to create a new folder if necessary. It takes about 10 minutes to copy the files from the Vista DVD.

Next, select the Vista edition you want to configure. VLite is a "world citizen," so it's compatible with non-U.S. editions such as Home BasicN, BusinessN, and Starter, as well as Home Basic, Home Premium, Business, and Ultimate. Once you've made your selection, click OK. After you complete the copy and selection process, the vLite screen lists the location of the Vista files and the version information.

Before continuing, use the Options menu to check the location of the temporary files folder. The program displays a message if there's not enough space, so you can select a folder on a different drive. Click OK to close the Options menu; then click Next to continue.



After vLite copies your Vista DVD's contents, it's ready to customize the install files.

2 Choose a Task

In vLite's Tasks tab you can select or deselect the parts of your install process you would like to customize:

- Integration: integrates hotfixes, drivers, and language packs
- Components: removes unneeded components to reduce the size of the Vista install image and the installed size of Vista
- Tweaks: adjusts the Vista configuration to save time and steps after installation is complete
- Unattended Setup: automates Vista setup to save time
- Bootable ISO: creates a bootable ISO image or burns the image to CD or DVD.

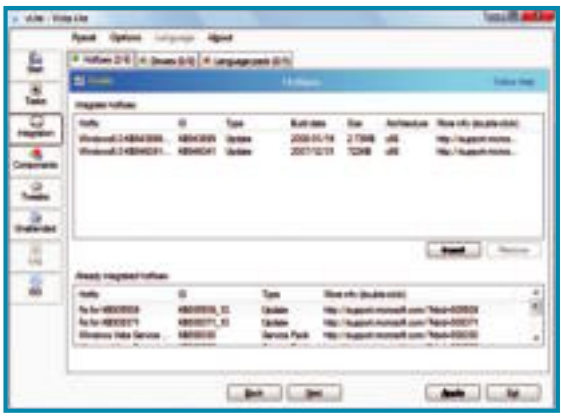
By default, all options are selected. We recommend you clear the "Enable before apply" option; otherwise, you might forget to apply changes, and you'll wonder why you created an ISO image identical to the original. When you disable this option, the program forces you to make and apply changes before it lets you make a bootable ISO. If you want to create only an unattended install image, clear all but the Unattended Setup check box. Click Next to continue.

3 Add a Side of Hotfixes and Drivers

Now you're in the Integration menu's Hotfixes tab. If you're customizing Vista SP1, you will see already-integrated hotfixes, but you can add additional hotfixes introduced post-SP1. (To locate them, go to **www.microsoft.com/downloads** and search for updates for Windows Vista SP1. Be sure to save, rather than run, hotfixes.) Click Insert, navigate to the folder containing the hotfixes you want to add to the installation, select them, and click Open.

To add drivers, click the Drivers tab. Use the Insert button and navigate to the appropriate folders to add drivers, which then appear at the bottom of the dialog.

Note that drivers included as a standard part of Vista or Vista SP1 are not listed. To add language packs, click the Language Pack tab. The current language in use is listed. Use the Insert button and navigate to the appropriate folders to add language packs. Click Next.



The more hotfixes you add to Vista SP1 now, the fewer you'll need to install later.

4 Kick Unwanted Features to the Curb

The Compatibility dialog opens next. Within the Features tab you can deselect the Vista features you want to remove. (We kicked Scanners and Cameras and Windows Fax and Scan to the curb, since we'll eventually use third-party apps for picture transfer and scanning.)

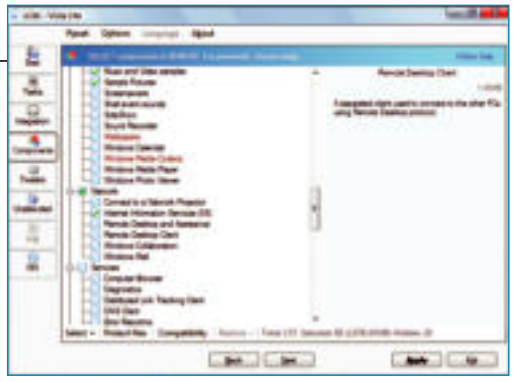
The Applications tab lists a few popular third-party apps that depend on Vista components, such as ACDSee/XnView and Halo 2. If you plan to install a listed application, click the empty check box next to it. Keep in mind that checked items will be included in the Vista installation image. Click OK to continue.

5 Remove Components to Slim Vista

The Components dialog can be tricky. Unlike the Compatibility dialog, the Components dialog is used to *remove* components in particular categories, such as accessories, drivers, and hardware support. Checked items will be removed from your image. As you select each item, a help dialog on the right side of the display lists the size of the item, what it does, and under what situations it should be kept. Items that can be particularly dangerous to remove are listed in red type.

We removed Paint, Snipping Tool, and Wordpad from Accessories (they won't be missed), almost all items in the Driver category except for some storage controller listings (we'll install updated video drivers ourselves), all games (Vista's games are pretty lame), fax and iSCSI support from the Hardware Support category, Asian language support from the Languages category, sample files from the Multimedia category, and IIS from the Network category. We kept all of the services.

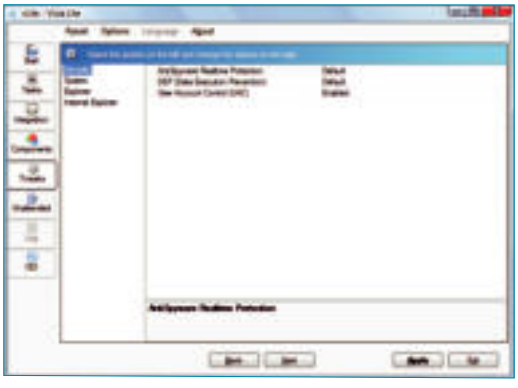
The original Windows Ultimate installation includes 172 total items. We selected 68 for removal. Once you have your list ready, click Next to continue.



Selecting components to remove can be tricky. Keep an eye on the Help window to the right for suggestions and warnings.

6 Tweak Now, Save Time Later

The Tweaks dialog allows you to preconfigure commonly changed settings in four areas. The Security option lets you edit Anti-Spyware Realtime Protection, Data Execution Prevention, and UAC options. The System section allows you to set AutoPlay and paging executive, hibernation, memory requirement, Power button, and Sleep button options. Explorer lets you edit view settings for the Control Panel, file extensions, hidden files and folders, and operating system files. And finally, the Internet Explorer option allows you to edit the IE Phishing filter and phishing verification balloon tips. Click an item you want to change (such as the Power button), and a pull-down menu arrow appears to the right of the current setting. Select the setting you prefer. Click Next to continue.



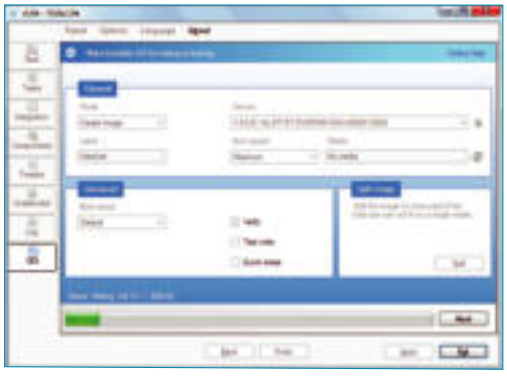
If you're always tweaking these settings anyway, let vLite do it for you, and you won't have to make the changes ever again!

7 Run an Unattended Installation

The Unattended dialog helps you create an unattended installation. In the General tab, you can select your preferences for the install process. "Select this version on install" refers to the version of Vista you specified when you started vLite; the "Protect your PC" button lets you choose an automatic-update setting. In the Regional tab, you can specify the UI language, time and currency format, keyboard or input method, and time zone.

8 Burn a New Installation Disc

Once done with the Unattended tab, click Apply to open the Apply Method dialog. Of the three options given, use Rebuild One (the default) to create the smallest ISO image and smallest installation size (select the others to see suggestions on when to use them). Click OK. It takes about 15 minutes to complete changes to the install image. Click Next when prompted to open the ISO menu. You can create an ISO file on disk, CD, or DVD. You can adjust burn speed, verify the image after writing it, perform a simulated test write, or split the image to fit onto multiple CDs. After you create an install disc, use the Preset menu to save your configuration for reuse before exiting vLite. MPC



You get a few different options for making your final disc, based on how much time you want to spend!

Ask the Doctor

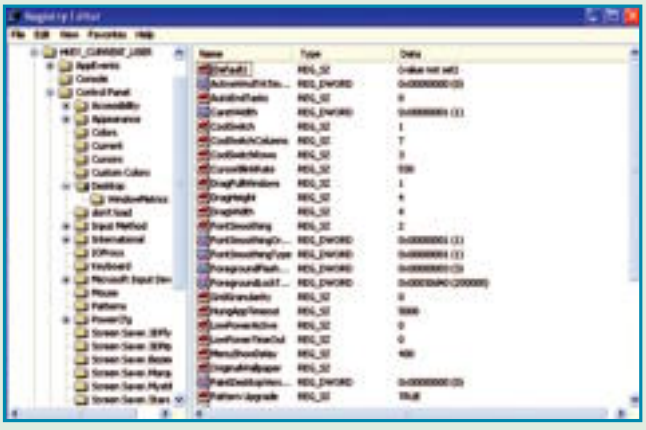
Diagnosing and curing your PC problems

MISSING REGISTRY OPTIONS

In your magazine's March issue, there is a Windows tip on page 23 titled "Automatically Kill Processes and Shut Down Quicker." I wanted to check out the tip on my own machine, only I don't see the "AutoEndTasks" and "WaitToKillApp" options in my registry. Where'd they go?

—Chuck Wilson

First off, you're using Windows XP, right? You won't find these options in the Vista registry. Also, make sure you're searching the correct registry folder. Just to reiterate, you'll want to open the Windows registry by hitting the Start button, selecting Run, typing `regedit`, and then hitting OK. Scroll all the way up and collapse the folders on the left-hand side until you see only a list of folders that start with HKEY. Now expand folders (by clicking on the plus-box) in this order: HKEY_CURRENT_USER, then Control Panel. Click the Desktop folder, which should pull up the three registry keys noted in the tip: AutoEndTasks, WaitToKillApp, and HungAppTimeout.



Don't accidentally edit (or delete) any values in the registry. A wrong slip could damage your operating system.

If you still don't see them, and you're positive you're running Windows XP, you can add the registry strings manually. Start by right-clicking on the section of the Registry Editor window that contains all the keys and clicking New, then String Value. Right-click the new value and rename it `AutoEndTasks`, then double-click the value and make it 1. Repeat the same step to create a WaitToKillApp string with a value of 1,000 and a HungAppTimeout string with a value of 3,000.

WHERE'D THE GAME GO?

I recently built a new computer and it runs great, except when I play games. I'll start a game and the screen will just go blank. My computer looks like it's changing the screen resolution, but then it just dumps me back to the desktop with the game window minimized in the taskbar. I have been able to get around this for a majority of games by running them in Windowed mode, setting the resolution to be the same as the desktop (for the few games that have a setup screen before they launch), or manually editing the configuration files to set the screen resolution to match my desktop resolution. I'm not trying to run some off-the-wall resolution, just standard 1280x1024 at a 72Hz refresh rate.

—Andy Rabin

After scratching his head for a minute, the Doctor thinks he has conjured up a potential solution for your woes. It sounds as though a background program is either pulling you out of your game or preventing you from even getting any games running in the first place. As for what that program is, well, the Doc just isn't sure. The culprit could be anything—a Folding@Home client, Vista's Sidebar application, anything.

To get to the bottom of the issue, you'll need to run a number of experiments. First, was there ever a time when your computer worked correctly? Do you recall installing a program or running an update and then being unable to play games? Start your investigation there. Next, disable running processes. Don't allow applications to load when your OS starts. Uninstall software you've played around with that comes with a background component.

The Doctor can't stress this enough: Any program could be at fault. Check out your firewall application, your virus scanner, and your custom screensaver. No program is above suspicion, and the Doc is willing to bet that once you've axed a few applications, your games will work perfectly once again. If not, you might be facing a visit to Mr. Wipe 'n' Reinstall.

LOUD NOISES!

Help me, Doc! I had my rig running smoothly until I picked up another 8800GT to run SLI. Now, for no apparent reason, and at random intervals, my sound will cut out and I'll get a very high-pitched ***beeeeeeeeeeeeeeeeeeeeeep*** *until I restart my PC. This happens only when I play games. So far, I have experienced it in BioShock, Thrillville, and Team Fortress 2. It hasn't happened in Civilization 4 or some casual games like Diner Dash or B-Intruders.*

It's totally random. It can happen after five minutes of play, or two hours (or more!), or not at all. Due to this, I feel I can rule out overheating. To troubleshoot, I've already removed and reinstalled my sound drivers, shifted my soundcard in my PCI slots, and reinstalled video drivers.

Remember, this problem was caused after I dropped another 8800GT into my PC to run SLI. I'm convinced that's the culprit; I just don't know what I should do to begin fixing it!

—Richard Gardner

Richard, the Doctor smiles upon you, for you are entirely correct. The problem you describe is a direct result of adding a second videocard to your machine. You didn't mention what soundcard you have, but the Doc is willing to venture that it bears the Creative brand. If that's the case, you've likely found the source of your troubles—Creative cards don't play nicely with nForce motherboards, typically when the board is running SLI.

Still, the issue isn't easily isolated. The Doctor has seen reports of this loud screeching problem occurring across various motherboards, operating systems, and even soundcards. You didn't mention whether you updated your BIOS, but do that first. If the problem persists, default to your motherboard's onboard audio and see if that helps. Other than that, you'll be playing a guessing game. You can try buying new hardware—the Doctor would start with a different-brand soundcard—but know that anything you do has the potential to leave your problem entirely intact.

Frankly, the Doctor would rather lose EAX support (somewhat nullified by Vista's OpenAL support) than lose his hearing from screeching speakers.

Ask the Doctor

Diagnosing and curing your PC problems

MORE MEMORY?

I'm a computer guy and have gotten a lot of questions, and have some of my own, about how much memory Windows 32-bit operating systems can see. I've heard that the videocard can eat into memory over the 2GB mark. Is it worth buying more than two or three gigs of memory if your videocard prevents Windows from seeing the RAM? The more I read and find out, the more confused I get.

—Joe Lentine

The Doctor waffles on this all the time, and you probably will too. First, here's the poop: Windows XP and Windows Vista can address a maximum of 4GB of RAM. Of that, 2GB can be used by applications and 2GB can be used by the OS. It's more complicated than that, but to cut to the chase, the Doctor thinks that, generally, 2GB of RAM is optimal, but a little more, especially at today's prices, can't hurt. Your system will probably show only 2.5GB or 3GB of RAM (depending on your configuration), but don't be alarmed, the rest is there. And although the applications may not be able to access it, the OS and drivers supposedly can.

MOLTEN CORE

A few years back, our family purchased a Dell Dimension 3000 desktop. It has been working fairly well, despite the fact that there are only 7GB left on the 80GB hard drive and the Vista upgrades are bogging it down.

Recently, our computer has been shutting down randomly. When we turn it back on, a notice pops up that says the computer has shut down due to a "thermal event." I'm no genius with computers, but I know enough to understand that something's up. There have been times when we've kept the computer on for days at a time, but that never used to be an issue. Has a fan broken? I tried contacting Dell to figure out this problem, but because our warranty on the computer has expired, Dell refuses to help us free of charge!

—Patrick Feeney

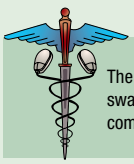
Well, Patrick, the Doctor has a few suggestions to ease the "thermal event" situation you're seeing. For starters, see if the fans in your computer are working properly. Pop off the side of your case and power up your machine. The fan cooling your CPU should spin up to a quick speed. If it seems sluggish, or isn't moving, there's your problem. Replace the fan.

If you can't discern any noticeable problems with the fans, you'll have to dig a little deeper. Pop off your CPU cooler and give the heatsink and fan a hearty blast of compressed air. Clean off the thermal paste from both your CPU and cooler with some rubbing alcohol. You'll now want to apply a new layer of paste—of course, you should purchase this prior to removing the CPU cooler. Squeeze a rice-size grain of paste onto your CPU and spread it around with a utility knife.

If that doesn't fix your problem, take a look at your power supply. Other Dell users have reported problems similar to yours, and a quick replacement of the power supply fixed everything. You can get replacement PSUs from Dell or at www.pcpower.com.

And if that doesn't solve your problem, the Doc knows of only one other cause for the dreaded "thermal event" message. Some Dell motherboards tend to run into problems with their capacitors—they'll swell up and possibly even burst. While the Doctor doesn't believe you're at the stage where your motherboard is going to start emitting popping noises and leaking toxic materials, there's certainly the possibility that the capacitors on your motherboard are dying.

And how do you fix that? The short answer is: You don't. You'd have to replace your motherboard. Since your warranty has run out, it will cost you more than the machine is worth to have Dell do the work. It might be time to consider buying, or better yet, building a new system. In the latter case, you can use any of your current machine's salvageable parts. Check out the April 2008 issue of *Maximum PC* for a step-by-step guide to building a new PC! MPC

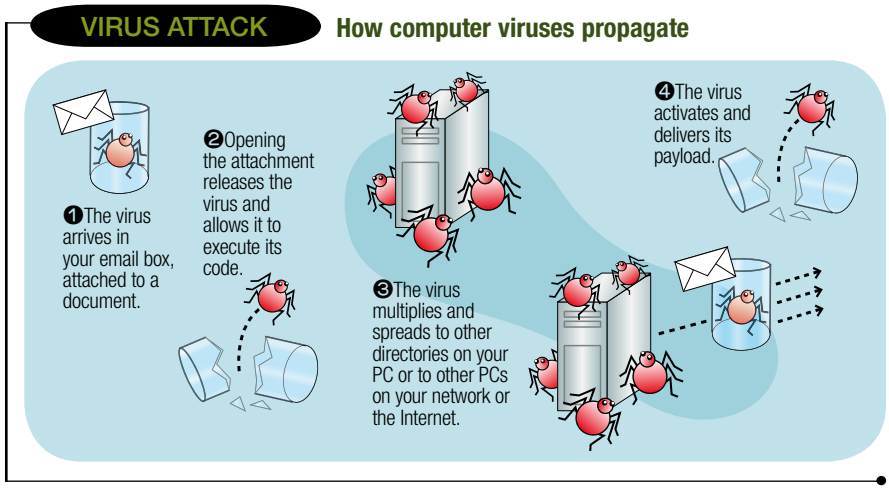


The Doctor is as excited as ever for next month's issue of *Maximum PC*. He's moving to swankier digs and abandoning this grungy space forever! But please continue to email your computer questions to **doctor@maximumpc.com**. He's just upgrading, not going away.

White Paper: The Evolution of Viruses

These technological beasties can take on lives of their own—much like their biological namesakes

BY ZACK **STERN**


VIRUS ATTACK
How computer viruses propagate
❶The virus arrives in your email box, attached to a document.
❷Opening the attachment releases the virus and allows it to execute its code.
❸The virus multiplies and spreads to other directories on your PC or to other PCs on your network or the Internet.
❹The virus activates and delivers its payload.

The first computer virus appeared more than 30 years ago, which renders this class of pestilence a mere infant compared to the real thing. But 30 years is an eon in technology time, and the critters—and their creators—have morphed and adapted to resist every effort to stamp them out. While early viruses were the innocuous work of geeks seeking a creative outlet, many of today's computer viruses are hatched with criminal intent.

PRIMORDIAL VIRUSES

The first computer viruses were created for exploration and experimentation; they often did little more than replicate. "Very early viruses were kind of proof of concept," says Craig Schmugar, threat research manager for McAfee Avert Labs. "[They were] written by, effectively, geek programmers who had a lot of skill and who knew what they were doing. In some respects it was almost like an art form to them."

Creeper, which appeared in the early 1970s on the ARPAnet (the progenitor of the Internet), is a case in point. It did little more than spread across the network and taunt its victims.

When John Walker, creator of the 20-questions-style game Animal, wanted a better distribution method than mailing tapes (this being 1975, magnetic tape was the prevalent means of data storage), he turned to a second program of his creation called Pervade. Attached to Animal, the Pervade code copied the game to all the directories the game player had access to. As a result, both Animal and Pervade made their way into the accounts of system administrators, who spread both programs to even more systems—via tape, ironically enough. From there, it didn't take long for the programs to spread to computers across the United States. Walker, who went on to found Autodesk, had no malicious intent—he just wanted to distribute his little game—but his technique blazed a path for modern virus propagators.

The first personal-computer virus broke into the wild in 1982. Created by high-school freshman Richard Skrenta, Elk Cloner spread by copying itself from an infected Apple II floppy disk to the host computer's system memory. The virus would reside in memory until another floppy was inserted, at which point the program would copy itself to the new disk. When the disk was used to boot the machine (Apple II computers didn't have hard drives), the embedded virus would display a short poem on every 50th startup.

Computer viruses became more prevalent in the 1990s, and they exploded with the widespread availability of Internet access. A hacker culture began to take root. Most virus writers remained tinkerers, but they sought more widespread fame and even formed communities.

The use of macro viruses was one common technique for spreading an attack as quickly as possible. The ubiquity of programs such as Microsoft Word and Excel—with their built-in scripting language—gave virus writers a new way to toy with systems.

MODERN TIMES

The virus economy today is booming, for the virus writers as much as it is for the antivirus doctors. "It's scary how literal a business it is," says Zulfikar Ramzan, senior principal researcher at Symantec. "You have a lot of people who had really good technical skills, but when the economies in [Eastern Europe and Asia] drastically shifted… [they] were out of a job and needed some outlet to make income." By analyzing attacks, Ramzan says he can tell the time of day these kinds of viruses are written—a fingerprint that reveals the authors to be 9-to-5 employees. They even write clean, commented code in order to ease collaboration.

These often-criminal enterprises create viruses that can generate illicit profits in several ways: Keyloggers can steal passwords, credit cards, and identities; and botnets create massive, distributed platforms that can be leased for spam mailings, phishing, denial of service attacks, and other uses. Some of these groups even sell virus toolkits with full graphical user interfaces, so their customers can install their own payloads. "They actually offer technical support if you're having trouble getting it installed," according to Schmugar.

The original viruses often simply taunted victims with their presence, but today these ventures make the most money by staying quiet to delay their removal. Some viruses even download modified antivirus software as their first step, blocking infection from competitors while fooling the host system into behaving as though it's healthy.

Rootkits often help viruses avoid detection. These tools are nothing new; system administrators sometimes use them to manage PCs or hide critical files. But viruses often use these low-level tools to mask their

presence while gaining complete access to a machine. Once free to muck around, viruses can modify the kernel and process list to stay hidden even if a user asks which programs are running. And boot-record viruses in the spirit of Elk Cloner are once again becoming popular because they can be difficult to detect and purge.

Security researchers and less-predatory hackers have also become a part of this monetized culture. Maintaining a "white hat," or ethical, approach, they root out vulnerabilities in code and then follow established disclosure practices to inform companies about security flaws in their products before going public with the information. Some software developers even pay bounties for such tips.

BREAKING IN

Sometimes, computer owners make the hacker's job entirely too easy. "The main security issues today are not so much technical as they are social," notes Symantec's Ramzan. "Hackers often just ring the doorbell and ask to be invited in. Although there are ways to compromise a system by finding a technical hole, the most common way hackers try to compromise systems is by finding the *human* hole, by emailing you an attachment with malicious code and telling you to execute it by yourself." These initial bits of code often work as a stage downloader, with the main objective being to clear a path for the malicious bytes to follow.

Sloppy programming, on the other hand, creates opportunities for viruses to infect a system without a user's help. The buffer-overflow attack is one of the most common exploits. The virus designer, for example, might identify a point at which the software expects user input. Instead of entering a normal amount of data, the virus floods the query, overwhelming the program. Executable code hidden within this tsunami of data gains control of the host machine and overrides the program, tricking the computer into running a new set of instructions.

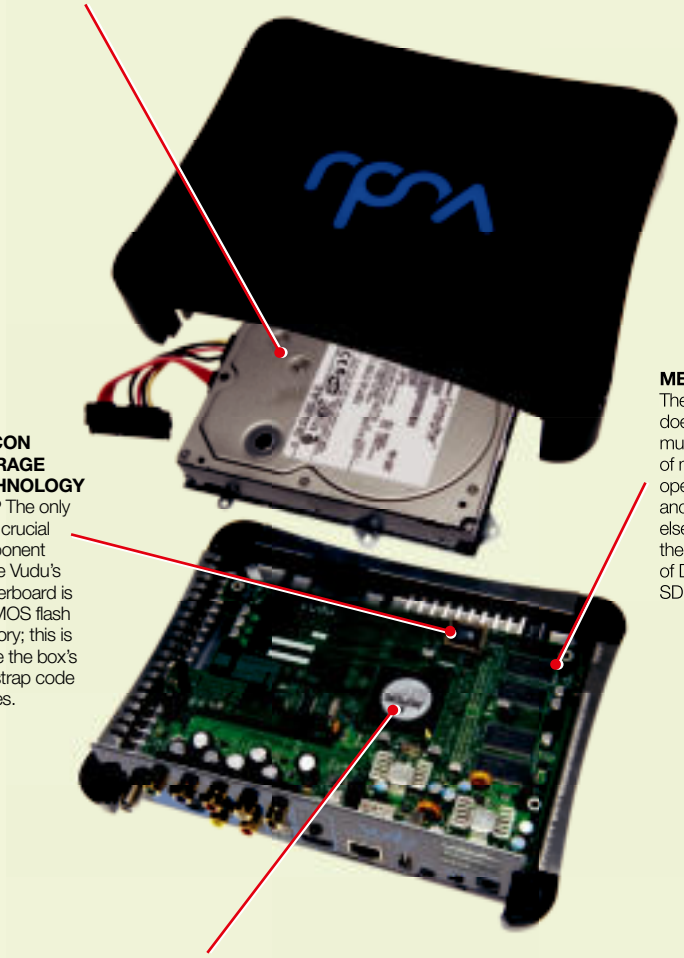
"Code itself is a type of data," Ramzan explains. "It's basically data that can be executed on a machine. Sometimes that distinction is not actually made at a very low technical level, and that's what often causes these vulnerabilities to occur. At the end of the day, they're all just bits, and your computer has to know which one's which."

Fortunately, it's easy to protect your PC from viruses and cyber criminals. Install an antivirus program, perform periodic scans, and don't do anything that would make it easy for criminals and mischief-makers to take advantage of you. MPC

Vudu HD Movie Box

Based on its performance and price point (which has dropped from $400 to $300), we predicted we'd find a laptop motherboard with a low-power CPU and perhaps either an inexpensive GPU or integrated graphics when we peeled open this high-definition movie box. Man, were we off base.

HITACHI HARD DRIVE The Vudu stores its downloaded movies on this 250GB Hitachi CinemaStar 7K500 hard drive. The CinemaStar is optimized for digital video applications, so it trades some error correction capabilities (which aren't as crucial for streaming as they are for other types of data storage) in favor of reduced power consumption (which leads to lower thermals) and quiet operation.



SILICON STORAGE TECHNOLOGY CHIP The only other crucial component on the Vudu's motherboard is its CMOS flash memory; this is where the box's bootstrap code resides.

MEMORY The Vudu box doesn't need much in terms of memory—its operating system and everything else fits within these four pieces of DDR/400 SDRAM.

BROADCOM CHIP The Vudu is nearly a single-chip computer, with this Broadcom BCM7401 high-definition set-top box processor performing nearly every function. This one part decodes MPEG-4 video and Dolby Digital Plus audio and performs digital noise reduction. It also drives the Vudu's 2D graphical user interface and the HDCP-protected HDMI interface, controls the Vudu's SATA hard drive, decrypts copy protection, receives and processes commands from the RF remote control, interfaces with a smart card, and serves as a 10/100Mb Fast Ethernet controller.

Any requests? What hardware—new or old—would you like to see go under *Maximum PC's* autopsy knife? Email your suggestions to **input@maximumpc.com.**

GORDON **MAH UNG**

Cross-Examines CrossFireX

Is four better than two? In this case, yes

I've been skeptical of multi multi-GPU support since the days of Nvidia's original Quad SLI. Back then, bad drivers, a lack of game support, and 30-inch panels that cost a month's pay made the prospect unpalatable.

So when AMD sent us an Alienware ALX system decked out with four GPUs, I didn't expect much. But the dual Radeon HD 3870 X2s in this rig performed pretty damn well. In a system sporting a 3GHz Core 2 Extreme QX6850 overclocked to 4GHz, an Asus X38 board, DDR3/1800 RAM, and Windows Vista, the double double-barreled 3870 X2s' performance at ultra-high resolutions shocked the hell out of me. In 3DMark06, Call of Duty 4, and Unreal 3, I saw a roughly 40 percent increase in frame rates going from one Radeon HD 3870 X2 to two.

CROSSFIREX PERFORMANCE

	CROSSFIREX	SINGLE CARD	% DIFFERENCE
3DMARK OVERALL 2560x1600, DX9	21,050.0	12,889.0	38.8%
3DMARK06 HDR1 CANYON FLIGHT 2560x1600, DX9 (FPS)	52.7	30.0	43.1%
3DMARK06 HDR2 DEEP FREEZE 2560x1600, DX9 (FPS)	51.3	26.0	49.3%
CALL OF DUTY 4 2560x1600, DX9 (FPS)	93.0	73.0	21.5%
UNREAL 3 CTF-OMICRONDAWN_BOT 2560x1600, DX10 (FPS)	118.0	65.6	44.4%
UNREAL 3 CTF-OMICRONDAWN_BOT 2560x1600, DX9 (FPS)	120.3	68.5	43.1%

AMD's Radeon HD 3870 X2 in quad mode scales well for having four GPUs.

At lower resolutions, closer to reality, the four Radeon GPUs didn't up the ante quite as much at 1900x1200, but there was still a healthy 20 percent boost in COD4 and UT3. That's probably not worth filling that second slot, but at least the setup offers decent scaling. The Radeon HD 3870 X2 ain't perfect, though. Driver problems initially plagued our preview of the cards, so our assessment is that this quad-GPU solution isn't quite ready for prime time.

It's not much of a secret that Nvidia has its own second-gen Quad SLI coming out. It will use two new dual-GPU cards dubbed GeForce 9800 X2. It's obviously too early to say which will be faster, but the quad Radeon HD 3870 X2 at least presents a respectable dual-card solution for folks who want to build a high-res gaming box using an Intel X38 or even X48 chipset.

Will Smith

Gets Burned by the Apple TV

Says device should carry a 'filling may be hot' warning

As part of my testing for this month's cover feature, I spent a few quality days watching movies from the iTunes Store on my PC and in my living room. By necessity, I had to integrate a newly updated Apple TV into my entertainment center, which is a fairly common closed cabinet with a few air vents in the back. All of my other electronics devices—my receiver, my TiVo, my Xbox 360—live happily in this environment (although I do open the cabinet door when I fire up the 360).

After leaving the Apple TV connected overnight, I detected the faint smell of burning plastic in my living room. After investigating, I found that the Apple TV was actually too hot to touch—around 140 F. I don't know about you, but none of the other consumer electronics devices I own (save a towel-wrapped Xbox 360) gets this hot.

After digging into the documentation and Apple's support site, I was assured that the passively cooled Apple TV "may feel warm when touched." But that it was "designed to operate quietly in an environment warmer than room temperature, including within media cabinets." Eventually, I discovered a standby mode, which leaves the Apple TV running but disables the graphics hardware to minimize heating. You can access standby by holding down the Play/Pause button for a few seconds. That's great, but if I forget to manually put the Apple TV into standby, it won't automatically do it for me. That's just irresponsible and dumb. There's absolutely no reason for a modern CE device that gets this hot not to automatically shut down when it's not being used.

How We Test

Real-world benchmarks. Real-world results

We use the following multithreaded apps to test a PC's performance relative to our zero-point test bed:

Adobe Premiere Pro CS3: We take HD video shot on a pro Sony camera and output the edited results to a Blu-ray-friendly MPEG-2 file format. This test favors clock speed and likes quad-core CPUs.
Adobe Photoshop CS3: A gazillion Photoshop filters are applied to a RAW digital-image format.
Photodex ProShow Producer: This pro-level photo slide-show application spits out a hi-def MPEG-2 file format and favors multicore CPUs.
Mainconcept Reference: We take an HD-resolution MPEG-2 file and convert it to H.264/AVC with this multithreaded encoder. Used by advanced amateurs and professionals, this encoder likes fast, efficient multicore procs.
FEAR: Our DX9 gaming test runs at 1600x1200 with soft shadows and is a good approximation of gaming performance for slightly older titles.
Quake 4: Based on the Doom 3 engine, this OpenGL shooter is optimized for dual-core CPUs, and although older, it still reveals weaknesses in OpenGL drivers.

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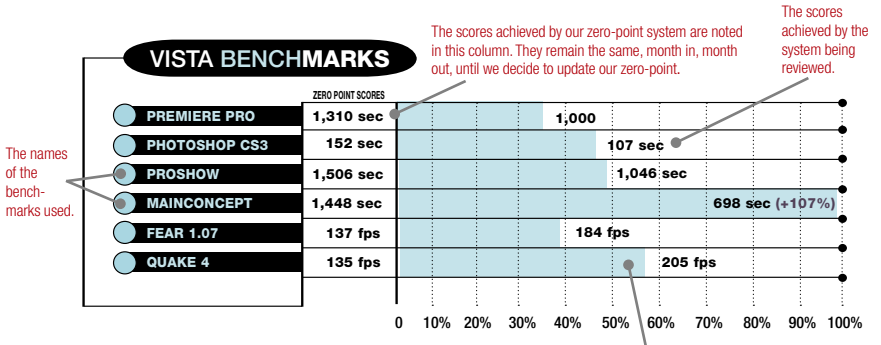
- CanaryWireless Digital HotSpotter Model HS-20
- The Club
- Antec Veris enclosure
- Cosmos Sport
- Rosewill enclosure
- Intelliscanner Mini
- Samsung i325 ACE
- CablesToGo RapidRun System
- Cambridge SoundWorks iPod Dock
- Soundcast SpeakerCast
- Cowon iAudio 7

How to Read Our Benchmark Chart

Maximum PC's test beds double as zero-point systems, against which all review systems are compared. Here's how to read our benchmark chart.



The scores achieved by our zero-point system are noted in this column. They remain the same, month in, month out, until we decide to update our zero-point.

The scores achieved by the system being reviewed.

The names of the benchmarks used.

Our current desktop test bed consists of a quad-core 2.66GHz Intel Core 2 Quad Q6700, and 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard. We are running two EVGA GeForce 8800 GTX cards in SLI mode, Western Digital 150GB Raptor and 500GB Caviar hard drives, LG GGC-H20L, Sound Blaster X-Fi, and PC Power and Cooling Silencer 750 Quad. OS is Windows Vista Ultimate

Every month we remind readers of our key zero-point components.

The bar graph indicates how much faster the review system performed in respect to the zero-point system. If a system exceeds the zero-point performance by more than 100 percent, the graph will show a full-width bar and a plus sign.

Falcon Northwest FragBox II

This small formfactor rig surprises in more ways than one

Toting the FragBox II to a LAN party is easy, thanks to the beefy handle on top.

Can you get Ferrari performance for the price of a Camaro? That's the question we asked when we uncrated Falcon Northwest's small formfactor FragBox II. Falcon, the recognized father of the modern gaming PC, normally throws us lustworthy $9,000 gaming rigs. At $1,500, the FragBox II is no such home wrecker.

That doesn't make it any less of a machine, though. Inside the solidly constructed aluminum box is Intel's new Core 2 Duo E8400 dual-core CPU. Codenamed Wolfdale, this 45nm chip runs at a stock clock of 3GHz, which Falcon gooses a notch to 3.24GHz. With the Wolfdale capable of much, much higher speeds, why not crank it up even more? Falcon said the FragBox II is designed to be a cool-running, quiet, inexpensive gaming box. Overclocking it further would have upped the noise and thermals too much.

The E8400 is plugged into an Asus P5E-VM DO mobo that's based on Intel's Q35 integrated-graphics chipset. The craptacular Intel graphics are switched off and an EVGA GeForce 8800 GT takes command from the board's single x16 slot; a 500GB Seagate hard drive, a Lite-On DVD burner, and 2GB of RAM round out the package.

Pretty standard fare? Not really. We're used to Falcon being just about perfect when it comes to system configurations, but we were baffled by this rig's RAM setup. With four DIMM slots available in the FragBox, Falcon chose to outfit the machine with 2GB in a single slot. Even Mac users know that you need to populate two DIMM slots for dual-channel support. So why would Falcon configure RAM in single-channel mode?

Falcon gave us three reasons for this decision: There's only a minimal performance advantage to running dual-channel mode with this box; RAM is the second-most-likely component to fail (the GPU is first), so using just one DIMM cuts the chance of failure in half; and three free DIMM slots provides a better upgrade path.

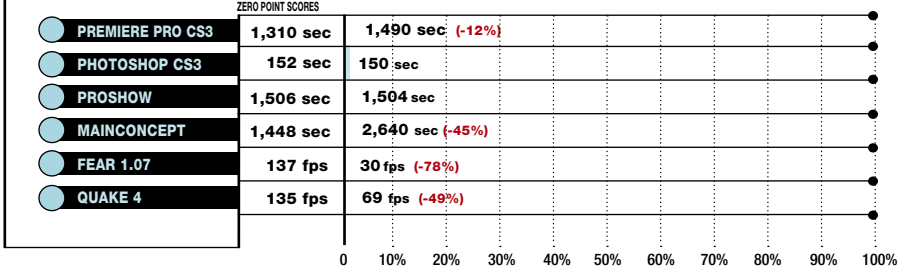
Sure, buddy. Skeptical, we called Falcon's bluff and populated the rig with two 1GB sticks of DDR2/800 and reran our tests. The results? Pretty much the same. What the hell? We admit that it's been a few years since we benched dual-channel vs. single-channel configs, but dual-channel has become the de facto configuration for enthusiasts. Could the 6MB of L2 in the Penryn CPU really be ameliorating RAM bottlenecks? We're not sure, but obviously, there's egg on our faces, not Falcon's.

In performance benchmarks, the FragBox II didn't break any records, but it didn't fall on its face, either. Up against our standard quad-core GeForce 8800 GTX SLI zero-point *desktop* box, the FragBox II gets smoked in the gaming benchmarks and our Main Concept H.264 encoding test,

UNDER THE HOOD

BRAINS	
CPU	Intel Core 2 Duo E8400 (3GHz overclocked to 3.14GHz)
MOBO	ASUS P5E-VM DO
RAM	2GB Crucial DDR2/800 @ 716MHz (one 2GB stick in single-channel mode)
LAN	Gigabit
HARD DRIVE	One Seagate 500GB 7,200rpm Barracuda
OPTICAL	Lite-On LH-20A1H
BEAUTY	
VIDEOCARD	EVGA GeForce 8800 GT (650MHz core, 950MHz RAM)
SOUNDCARD	Onboard
CASE	Custom Silverstone
BOOT: 48 sec.	DOWN: 7 sec.

VISTA BENCHMARKS



Our current desktop test bed is a Windows Vista Ultimate machine using a quad-core 2.66GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard, two EVGA GeForce 8800 GTX videocards in SLI mode, Western Digital 150GB Raptor and 500GB Caviar hard drives, an LG GGC-H20L optical drive, a Sound Blaster X-Fi soundcard, and a PC Power and Cooling Silencer 750 Quad PSU.

Falcon keeps the FragBox II's price at $1,500 by using a GeForce 8800 GT and a new Wolfdale Core 2 Duo chip.

but interestingly, the dual-core Penryn holds its head up high in the ProShow Producer, Photoshop CS3, and Premiere Pro CS3 tests. The extra 575MHz and faster Penryn design is just enough to achieve parity with the older quad Kentsfield.

We couldn't compare the FragBox II's performance against that of the $1,500 PC we built for the April issue because the OSes are different, but we can compare specs. Our desktop machine outdoes the FragBox II in just about every category: RAM, graphics, storage, and CPU; however, that comparison may be unfair since a desktop is still cheaper to build than a small formfactor rig.

What we have here is a reasonably fast small formfactor box that's good for standard-resolution gaming. You don't want to pair this wee rig up with a 30-inch panel—and really, who wants to lug a 30-inch LCD to a LAN party. The bad news is that we probably wouldn't use the FragBox II with even a 24-inch panel, but that's because we're used to the smoking performance of GTX cards in SLI.

We certainly don't think the FragBox II is perfect. We would have preferred a quad-core Penryn inside and perhaps a GeForce 8800 GTS 512 card, but then it wouldn't be a $1,500 box or nearly as quiet. Of course, we're still not sold on Windows Vista, but we're getting as resigned to it as a 2-year-old is to a new baby sibling. We know that Mom and Dad just aren't taking the new kid back to the hospital, even if he is Chucky.

Falcon's FragBox II is not as sexy as what the company normally produces, but for a $1,500 small formfactor machine, it's pretty damned solid.

—GORDON MAH UNG

FALCON NORTHWEST FRAGBOX II

MATCHBOX
A Falcon Northwest PC that doesn't break the bank.

HOTBOX
Windows Vista still *suxors,* and the rig isn't suited for high-res gaming.

8

$1,500, www.falcon-nw.com

Lite-On 20A4PU EZ-Dub Optical Drive

Goes where you go, and looks good too

One of the most obvious differences between an external optical drive and its internal brethren is in appearance. A device that's going to sit out in the open for anyone to see, after all, has to look the part. Lite-On's latest EZ-Dub optical drive accomplishes this with a fashionable white and black aesthetic that would surely do Apple proud. It's an update from the more staid look of the previous EZ-Dub model, which was also nearly two inches longer and a half-inch taller. As with the older model, this EZ-Dub comes with a stand, so you can set the drive on its side to save desktop space.

Another distinction of external drives is convenience. The EZ-Dub connects to a PC via USB and is ready to go with you anywhere. Lite-On also equips the drive with two touch-sensitive buttons to make common optical chores easier: a Dub button for disc-to-disc copies and a File button for backing up files to a disc. Pressing the button automatically launches the bundled EZ-Dub software, and then it's just a couple steps to completing the aforementioned tasks. In the end, it saves a bit of time, but these tasks aren't all that laborious when you use the traditional means: The drive also comes bundled with the Nero 7 Essentials package.

If you're short on desk space, an included stand lets you set the EZ-Dub optical drive on its side.

Of course, what should matter most about any optical drive is its performance. The EZ-Dub is rated for 20x DVD+R write speeds, just like the Samsung SH-S203 that we've been recommending for many months. But Lite-On's drive took a full minute longer than Samsung's to write 4.38GB to a single-layer DVD+R (6 minutes vs. 5 minutes). And when writing to a double-layer disc, Lite-On's drive took 17:56 (min:sec) to Samsung's 13:10. Still, these scores are solid, if not stellar—and if what you're after is an external drive solution, Lite-On's EZ-Dub is a credible choice.

—KATHERINE STEVENSON

BENCHMARKS

	LITE-ON 20A4PU EZ-DUB	SAMSUNG SH-S203
DVD WRITE SPEED AVERAGE	12.10x	**13.45x**
DVD READ SPEED AVERAGE	12.07x	**12.13x**
ACCESS TIME (RANDOM/FULL)	115/205ms	**116/198ms**
DVD+DL WRITE SPEED AVERAGE	6.79x	**9x**

Best scores are bolded. All tests were conducted using the latest version of Nero CD-DVD Speed and Verbatim media (except where noted). Our test bed is a Windows XP SP2 machine using a 2.66GHz Intel Core 2 Quad Q6700, 2GB of Corsair DDR2/800 RAM on an EVGA 680 SLI motherboard, one EVGA GeForce 8800 GTS card, a Western Digital 500GB Caviar hard drive, and a PC Power and Cooling Turbo Cool PSU.

LITE-ON EZ-DUB DRIVE **8**

$75, www.liteonit.com

EVGA e-GeForce 9600 GT SSC Edition

Need a new videocard? Lucky you!

There's never been a better time to be in the market for a new videocard. Nvidia's GeForce 9600 GT, represented here by EVGA's overclocked SSC Edition, is one reason this is true.

We awarded AMD's Radeon 3870 a Kick Ass award in our January 2008 issue when it was selling for $260. When the 9600 GT hit the market, the *average* street price for cards based on the 3870 plunged to $206. EVGA's implementation of the 9600 GT was selling for $215 when we benchmarked it, but the average price for cards based on that part was just $182.

The 9600 GT is based on Nvidia's G94 GPU, a cut-down derivative of the G92 that forms the more powerful 8800 GT and the even faster 8800 GTS (the version with 512MB of memory, not the ones with 640MB and 320MB frame buffers). By "cut down," we mean all three chips share the same basic architecture, but the 9600 GT has 64 stream processors compared to 112 procs in the 8800 GT and 128 in the 8800 GTS.

The 9600 GT is a solid choice for both gamers and cinemaphiles.

EVGA upped the core clock to 740MHz (from a stock 650MHz) and the 512MB of memory to 975MHz (from a stock 900MHz). Nvidia's ace in the hole is its ability to run the stream processors at a higher clock rate than the core, which helps explain how the 64 processors in the 9600 GT can outrun the 320 stream processors in AMD's Radeon HD 3870. EVGA bumped them from a stock 1.625GHz to 1.835GHz.

If your interests lie more in film than gaming, you'll be pleased to know that the 9600 GT has the PureVideo HD circuitry that allows it to offload from the host CPU all the decoding work needed to play high-definition movies on Blu-ray and soon-to-be-obscure HD DVD discs.

—MICHAEL BROWN

BENCHMARKS

WINDOWS VISTA	HIS RADEON HD 3870	NVIDIA GEFORCE 9600 GT
3DMARK06 GAME 1 (FPS)	**22.8**	22.6
3DMARK06 GAME 2 (FPS)	**20.6**	19.8
CRYSIS (DX9) (FPS)	22.7	**24.1**
UNREAL TOURNAMENT 3 (FPS)	55.3	**62.7**

Best scores are bolded. Both cards tested with an Intel D975BX2 motherboard with an Intel 2.93GHz Core 2 Extreme X6800 CPU and 2GB of Corsair DDR RAM running Windows Vista Home Premium. Benchmarks performed on ViewSonic VP2330wb monitors. For XP benchmark numbers, see the review at MaximumPC.com.

EVGA GEFORCE 9600 GT **9**

$215, www.evga.com

MAXIMUM PC KICKASS

Trendnet Easy-N-Upgrader TEW-637AP

An alternate path to N

Trendnet's TEW-637AP is a great upgrade solution for older routers; it sucked wind, however, when we moved the client outside.

If you can't afford to upgrade your network to 802.11n Draft N 2.0, you might consider purchasing Trendnet's Easy-N-Upgrader TEW-637AP. Instead of throwing your existing router in the trash, plug it into the Easy-N-Upgrader access point to gain many of the benefits of a Draft N router for about half the price.

True dual-band routers operate one radio on the 2.4GHz band and the other on the 5GHz band—the ones we've tested have built-in gigabit switches. Trendnet's device, however, uses only the 2.4GHz band—the same one your older Wi-Fi router most likely uses—and since it's just an access point, it doesn't have a switch at all.

And while you *could* operate both access points at the same time—in fact, at no point does Trendnet's installation wizard advise you to turn off the radio inside your router—that leaves both devices competing for the same bandwidth.

You should ignore the installation wizard altogether in favor of the device's web-based user interface. Trendnet's default configuration leaves the router operating in mixed 802.11b/g/n mode with channel bonding turned off. In that scenario, with the radio on our Asus WL700gE 802.11g also on, the Trendnet delivered TCP throughput of just 29.3Mb/s at close range. When we turned off the Asus's access point and tweaked the Easy-N to run in 802.11n-only mode with channel bonding activated, throughput jumped to 81.7Mb/s.

The Trendnet's throughput was significantly faster than our 802.11g access point's inside the house. Its outdoor range, though, was less impressive: Our notebook couldn't maintain a connection to it in either of our exterior locations.

—MICHAEL BROWN

BENCHMARKS

	D-LINK DIR-655	ASUS WL700GE	TRENDNET TEW-637AP
HOME OFFICE, 5 FEET (Mb/s)	**90.5**	19.6	81.7
KITCHEN, 20 FEET (Mb/s)	67.4	19.7	**83.6**
PATIO, 38 FEET (Mb/s)	59.6	19.6	**72.9**
BEDROOM, 60 FEET (Mb/s)	28.9	19.4	**65.4**
MEDIA ROOM, 35 FEET (Mb/s)	**27.3**	14.0	19.2
OUTDOORS A, 90 FEET (Mb/s)	8.4	**13.1**	Unable to connect
OUTDOORS B, 85 FEET (Mb/s)	2.5	**4.8**	Unable to connect

Best scores are bolded. See http://tinyurl.com/yo8qa4 for detailed test criteria.

TRENDNET TEW-637AP **8**

$50, www.trendnet.com

Samsung HD103UJ Terabyte Drive

Where your data snuggles up with its neighbors

Nestled inside this 3.5-inch drive is a masterwork of areal density that sports a whopping 32MD cache.

Performance scores are one thing, but we're equally impressed by Samsung's technical accomplishment in achieving the highest areal density to date on its new series of Spinpoint F1 drives. And at the top of the heap sits the HD103UJ, the company's long-awaited drive that reaches an areal density of an astonishing 334GB per platter.

That's right. The HD103UJ sports a three-platter array, much to the likely embarrassment of its competitors in the high-capacity storage arena. Hitachi's first-to-the-market 7K1000 drive has five platters, while terabyte offerings from Western Digital and Seagate split the difference at four. What's the benefit of this increased areal density? In a word: speed.

Samsung's drive destroys all other terabyte models in many of the mission-critical benchmarks we run, including tests for average reads, writes, and real-world performance. HD Tach's synthetic tests show the drive achieving read speeds of nearly 100MB/s, with write speeds swimming along at 84.4MB/s. On the real-world side, Hitachi's Deskstar 7K1000 cruised to victory in three of our five PCMark05 tests: an XP startup simulation, application loading, and general use, but the HD103UJ's excellent write capabilities—it's 14MB/s faster than the Deskstar, as reported by HD Tach—helped it overtake the Deskstar by almost 300 points on the overall score.

The HD103UJ produced the slowest random access times of the three compared drives, but the effects of this and the drive's slower burst speeds were never apparent during our real-world tests. Hands-down, this is the fastest terabyte drive we have tested.

—DAVID MURPHY

BENCHMARKS

	HITACHI DESKSTAR 7K100	SEAGATE 7200.11	SAMSUNG HD103UJ
HD TACH BURST (MB/s)	**205.8**	195.5	204.5
HD TACH RDM. ACCESS (MS)	12.8	**12.6**	13.7
HD TACH AVG. READ (MB/s)	72.7	91.4	**96.8**
HD TACH AVG. WRITE (MB/s)	70.1	79.7	**84.4**
PCMARK05 OVERALL	7,764	7,323	**8,014**

Best scores are bolded. All benchmarks taken using HD Tach 3.0.1.0.

SAMSUNG HD103UJ **9**

$400, www.samsung.com

MAXIMUM PC KICKASS

Good things sometimes come in small packages.

Audioengine A2 Speakers

Tiny boxes, big boom

If you think deploying a subwoofer is a prerequisite to obtaining big-time bass, you haven't heard Audioengine's A5 speakers. And if you're convinced you need huge cabinets for thumping bass, you haven't heard the company's new diminutive A2 system.

We've been using Audioengine's A5 speakers as our reference point for speaker evaluations for many months—and they've been on our Best of the Best list ever since we laid ears on them—so we couldn't wait to see what the company's A2 system would deliver.

The A2's cabinets are about one-third the size of the A5's, which means they'll fit just about anywhere, and they feature an absolutely luscious black lacquer-like finish that reminds us of a concert grand piano. The drawback to the glamour is that dust and fingerprints show up instantly, and the latter are hard to obliterate.

The A2 features the same 20mm silk tweeters as the much bigger A5, and we were pleasantly surprised that Audioengine didn't overpower the 2.75-inch Kevlar woofers. The walls of the MDF cabinets are about a quarter-inch thinner than those in the A5.

The amp, located in the left speaker, delivers 15 watts RMS and provided more than enough power to fill a good-size bedroom. The amp has two sets of inputs in back, one RCA pair and one 1/8-inch stereo. Audioengine provides about 6.5 feet of 16-gauge speaker wire with bare ends, but the binding posts will also accept banana plugs if you roll that way. The company also includes drawstring pouches for the speakers, cords, and power cables.

While an all-around solid system, the A2's volume control would be much handier if it were located on the front of the cabinet, and we miss the convenient USB charging port that the A5 boasts. But we have no complaints with the A2's sound—it rocks, delivering spectacular sound with a wide variety of tunes. These speakers don't get as loud as some larger systems we've auditioned lately, but that's the only thing that holds us back from giving them a Kick Ass award.

—MICHAEL BROWN

AUDIOENGINE A2 SPEAKERS **9**

$200, www.audioengineusa.com

ViewSonic VLED221wm

It's dark in here!

ViewSonic's VLED221wm 22-inch LCD is the first LED-backlit display to grace our Lab, and we were anxious to put the technology to the test. LCD monitors typically sport cold cathode fluorescent backlighting, which can be less than uniform, and because it's always on in the background, it can impair a screen's ability to produce a true black. With LEDs, the screen is backlit with a grid of lights that can be turned on and off as needed. Sure enough, the 1680x1050 VLED221wm was capable of a black that exceeded that of any other LCD we've tested—but the result was actually overkill.

Even after we cranked the brightness to the max, we were unable to elicit an acceptable separation of values at the dark end of the spectrum in our DisplayMate (**www.displaymate.com**) tests. This lack of separation resulted in a noticeable loss of detail in games and movies.

The VLED221wm also notably boasts a 118 percent color gamut—based on NTSE broadcast standards—whereas LCDs have traditionally achieved a 72 percent color gamut, and more recently 92 percent. The expanded color gamut allows the VLED221wm to display extraordinarily saturated colors; the word "vibrant" doesn't do justice to the eye-punishing reds, greens, and blues this monitor spits out. In our tests, it made photos appear unnatural and game graphics looked overprocessed; however, we appreciated the added vibrancy in movies.

By default, the monitor comes with its Dynamic Contrast feature on, which adjusts the backlighting on the screen according to the content being displayed to achieve the darkest black and brightest white whenever possible. But the implementation here is pretty poor—during our movie test, the light faded in and out during different scenes. Fortunately, the feature can be disabled, although we had to dig through the manual to find out how—hold the monitor's up-arrow button for a few seconds.

Concealed at the bottom of the VLED221wm are two tiny speakers; behind them are a VGA and DVI port.

Given its spendy price point compared to fellow 22-inch monitors, ViewSonic's VLED221wm just isn't a wise choice. The concept of "true black" is a strong selling point, but not when it results in perceptible quality loss.

—DAVID MURPHY

VIEWSONIC VLED221WM **5**

$800, www.viewsonic.com

Future Sonics Atrio m8 Earbuds

Bass on a budget (an enthusiast's budget, that is)

We've tested a lot of earbuds over the past few years and invariably find ourselves gravitating toward products at the very high end of that market—we're talking buds that'll set you back more than the most expensive iPod. At $200, Future Sonics's Atrio m8 earbuds certainly aren't cheap—but they're competitive with some products that cost twice as much.

The first thing you notice when you stick the m8s in your ears and hit play is the bass response. We immediately pulled out these earbuds and did a double take to see how they could pump out so much low end. Exceptional bass is one of the attributes we've always dug about Shure's $400 SE530 buds, but they don't deliver nearly the sonic boom that the m8s produce.

To be fair to Shure, the SE530s deliver more frequency response at the high end of the spectrum, a fact we attribute to the three separate micro drivers in those buds, versus the single driver in the m8s. The bigger the driver, the easier it is to produce low end. A big driver also sacrifices highs, but Future Sonics has achieved a remarkable balance in its design.

Hold the m8s next to the SE530s and you can see where Future Sonics invested most of its manufacturing budget: the drivers. The m8s fit just as snugly and comfortably in our ears, and they were at least as effective at blocking outside noise, but they just don't look as elegant as Shure's product.

We listened to a wide variety of tunes encoded in both WAV and FLAC on Cowon's iAudio7 digital media player (look for our review at **www.maximumpc.com**). We dug how the m8s were able to deliver each of the musician's contributions on Betty Davis's "Git in There" (from *They Say I'm Different*). Davis's predatorily nasty growl is the obvious focal point of this song, and it sounded fabulously seductive on the m8s, but these buds also did full justice to the backup band's funky drum, guitar, keyboard, and bass work, too. These are some sweet buds.

—MICHAEL BROWN

Future Sonics's Atrio m8 earbuds deliver broad frequency response at moderate volume, which helps you resist the temptation to crank the volume to boost the bass.

FUTURE SONICS ATRIO M8

$200, www.futuresonics.com

9

MAXIMUM PC KICKASS

Frontlines: Fuel of War

This is what happens when you don't listen to environmentalists

With the price of oil surpassing $100 a barrel, the apocalypse imagined in Frontlines: Fuel of War may not be so far away. In this vision of the future, the world's remaining superpowers—split between two factions—clash in a winner-take-all war for Earth's last oil reserves. Lucky for us, this makes a great backdrop for some intense multiplayer skirmishes.

On each map, teams of up to 32 players scuffle for control of capture points, which connect to create a "frontline" that divides the map between friendly and enemy territory. In order to win a match, a team must take control of the entire map by either moving the shifting frontline to the end of the level or killing enough enemy troops. While the premise is similar to Battlefield's, the frontline concept prevents lone wolves from infiltrating enemy territory and capturing points away from the action.

In addition to selecting a weapon, players choose one of four roles, each of which comes with unique abilities that must be unlocked. An air-support player can call in air strikes, while a ground-support player can deploy mountable turrets. Our favorite role is drone technician, which gave us control of remote-controlled mini cars and helicopters to zoom around the map. These killer drones (which can self-destruct) were perfect for fishing out snipers hiding in the ruins of a fallen skyscraper and blowing up APCs filled with enemy troops.

Of the nine maps included, we favor the ones set in abandoned urban metropolises because they better accommodate infantry combat. Frontlines lets you pilot helicopters and jets too, but only one map was spacious enough for fun aerial dogfighting.

If you hear a buzzing sound, a suicide drone is probably nearby.

While the combat here feels solid, widespread bugs prevented us from joining servers, and glitches often crashed the game. Lack of joystick or voice-com support is unacceptable, and squad management feels like an afterthought. But if you can bear these frustrating shortcomings, Frontlines will adequately scratch your multiplayer itch until the next Battlefield game is released.

—NORMAN CHAN

FRONTLINES: FUEL OF WAR **7**

$50, www.frontlines.com
ESRB: T

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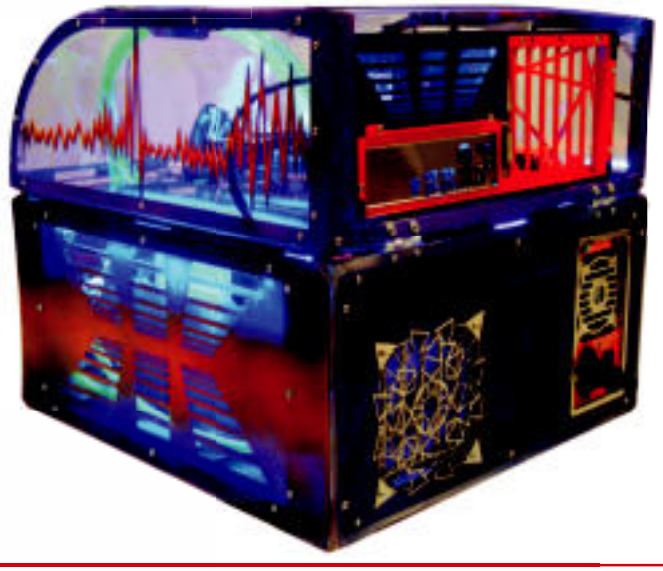
2 Win you a $250 gift certificate



TO ENTER: Your submission packet must contain your name, street address, and daytime phone number; no fewer than three high-res JPEGs (minimum size 1024x768) of your modified PC; and a 300-word description of what your PC represents and how it was modified. Emailed submissions should be sent to **rig@maximumpc.com**. Snail mail submissions should be sent to Rig of the Month, c/o Maximum PC, 4000 Shoreline Court, Suite 400, South San Francisco, CA 94080.

The judges will be *Maximum PC* editors, and they will base their decision on the following criteria: creativity and craftsmanship.

ONE ENTRY PER HOUSEHOLD. Your contest entry will be valid until (1) six months after its submission or (2) June 1, 2008, whichever date is earlier. Each month a winner will be chosen from the existing pool of valid entries, and featured in the Rig of the Month department of the magazine. The final winner in this contest will be announced in the July 2008 issue. Each of the judging criteria (creativity and craftsmanship) will be weighed equally at 50 percent. By entering this contest you agree that Future US, Inc. may use your name and your mod's likeness for promotional purposes without further payment. All prizes will be awarded and no minimum number of entries is required. Prizes won by minors will be awarded to their parents or legal guardians. Future US, Inc. is not responsible for damages or expenses that the winners might incur as a result of the Contest or the receipt of a prize, and winners are responsible for income taxes based on the value of the prize received. A list of winners may also be obtained by sending a stamped, self-addressed envelope to Future US, Inc. c/o Maximum PC Rig of the Month, 4000 Shoreline Ct, Suite 400, South San Francisco, CA 94080. This contest is limited to residents of the United States. No purchase necessary; void in Arizona, Maryland, Vermont, Puerto Rico, and where prohibited by law.

We tackle tough reader questions on...

✓Customized Logos ✓Soundcards ✓Building a $1,500 Rig ✓Sunbird

LOGO IS A NO SHOW

I tried the Make it Personal tip from your "Reinvent Windows" story (March 2008). But when I followed the instructions for customizing my machine with my own logo, all I could get was the text, not the graphic. Any idea why my logo didn't work?

—Robert Sylvan

CONTRIBUTING EDITOR PAUL LILLY RESPONDS: For the logo to show up, you need both the custom oemlogo.bmp and oeminfo.ini files in your C:\Windows\system32 folder. You can have support information show up without the logo, but you can't have the logo show up without the support information.

Since you mentioned being able to see the support text, the issue lies with the custom logo. Different-size logos will work, but for best results, stick to 180x114 pixels (width x height), being careful not to reverse the order (114x180 won't work). The image must be saved as a bitmap image (.bmp), and not a JPEG, GIF, etc.

COVERING OUR BUTTS

The "Build a $1,500 PC" article (April 2008) has a glaring and unnecessarily dangerous error in the very first step. The CPU cover does NOT need to be removed before installation of the CPU. It is designed to pop out after the processor is placed in the socket and the cover is closed. Unnecessarily removing the cover with, let's say a screwdriver, can potentially damage the socket. Oops! The best way is to always do less work, which equals fewer chances to screw up.

—Amanda Huggenkis

SENIOR EDITOR GORDON MAH UNG RESPONDS: I've never actually tried leaving on the CPU cover (technical name: pick-and-place cap) and letting it pop off on its own. In our instructions, we followed Intel's guidelines on how to install an LGA775 processor, which recommend removing the cover before installing the processor. I agree that you should not use a screwdriver to remove the cover—and we did not advise that in our story.

COVERING OUR HANDS

Thank you for a great article on building a $1,500 computer (April 2008). I have three questions: First, what's the reason for the blue gloves the demonstrator is wearing? Next, where can I get an antistatic bag? Finally, in step 3 you say, "Unclip the metal arm alongside the socket and flip out the load plate." There is a good picture of this load plate. In the next picture, you show the installation of the CPU. After the CPU is installed, what do you do with the metal arm? Do you leave it up, put it back down, or remove it? I appreciate your answers, as I may be building my own computer soon.

—Patricia Hanson

SENIOR EDITOR GORDON MAH UNG RESPONDS: The blue gloves were worn at the behest of our art department because they looked better than my gnarled hands—plain and simple. Your build won't be made any easier by donning them. The antistatic bag we refer to in the article is the one your motherboard comes in. No additional purchase is required. Finally, you're right, we assumed people would know to reattach the metal arm once the CPU was in place, but we all know what happens when you assume. If you don't, rent *The Bad News Bears in Breaking Training*.

Sound Advice

I want to build a $1,500 PC like the one in your April issue, but I can't decide which soundcard to include, the Creative SB X-Fi Xtreme Audio with the PCI-E interface or the Sound Blaster X-Fi Xtreme Gamer you used. Are PCI-E soundcards better than standard PCI ones (even if they are the same chip)? The Xtreme Audio model I was looking at has both PCI and PCI-E interfaces available.

—Kevin Taulbee

SENIOR EDITOR GORDON MAH UNG RESPONDS: If you want the card for gaming purposes (not just listening to music or movies), the X-Fi Xtreme Gamer is the better choice, as it actually offers full EAX support. The Xtreme Audio in either PCI-E or PCI does not support EAX because it uses a different audio chip than the rest of the X-Fi series. The other reason we like the XtremeGamer is that it actually includes an industry-standard HD Audio connector, so you can easily connect your X-Fi to your case's front-panel audio ports. PCI-E isn't important because soundcards don't need the bandwidth of PCI-E.

WALK LIKE YOU TALK

Just got my April issue and am looking over the "Build a $1,500 PC" article. My question is: If PCI-E 2.0 doubles the data rate, why would you not use a motherboard that has it. The article makes a big deal about using the best, fastest videocard you can afford. Are you shooting yourself in the foot by not having the best data-transfer capability with it? I'm about to build a new system and was thinking about using the X38 mobo instead of the P35 series because of the above issue. Is purchasing the X38 or X48 an inefficient use of my financial resources?

Since I'm on the topic of building, it seems to me that when you build systems, the "Best of the Best" (In the Lab) hardware picks are hardly ever used. Certainly in this case, you didn't use the motherboard, hard drive, videocards, or cases that you recommend on page 71. Need I go on?

—Darrell Hewko

SENIOR EDITOR GORDON MAH UNG RESPONDS: PCI Express 2.0 indeed doubles the data rate, but whether a graphics card can use that bandwidth yet is still up in the air. Would it be nice to have? Sure. Would I downgrade the videocard, soundcard, or hard drive to get there? No—not until I see compelling evidence that it's worth shifting the budget around. That's what happens when you build a machine on a fixed budget. It would be nice to pick everything from our "Best of the Best" list, but then it wouldn't be a $1,500 rig.

WINDOWS XP PRICING

Shame on you for misleading your readers. In your April issue, the "Build a $1,500 PC" article has an error. You state that the PC's Windows XP Professional OS costs $100. Not so unless you got a special discount. Microsoft's website lists the XP Pro Upgrade at $199 and the full OS at $299. If you can get XP Pro for $100, please tell your readers where they can find it.

—John E. Watson

SENIOR EDITOR GORDON MAH UNG RESPONDS: You're right. We made a boo-boo by saying the OS was Windows XP Professional. We meant to include Windows XP Home, which is available for less than $100. Another budget alternative is Windows XP Media Center Edition, which is available for $110. FYI, while we listed www.microsoft.com as the URL for the OS, we don't recommend that you buy from there. Windows XP Pro OEM is available today for $140 from Newegg.com, so there's no need to pay the full retail price for it.

TROJAN TROUBLES

After reading your Ask the Doctor column in the April issue, I decided to download the CPU-Z utility suggested therein, only to have several viruses hitch a ride on the app. I downloaded it from the CPUID website and to date have found "Sheriff.xxx" and "generic9.bhts" Trojans. I use AVG Anti-Virus and suppose the program may be recognized by AVG as a Trojan due to its signature, or it may be a legitimate Trojan. In either case, please warn your readers of this issue.

—Charles Sasse

ASSOCIATE EDITOR DAVID MURPHY RESPONDS: We've downloaded the very program you speak of from the official site (www.cpuid.com) on countless occasions, with nary a virus reported by any number of scanning programs—save for AVG. This leads us to believe that you're seeing a false positive—or you do have a Trojan on your system that's unrelated to CPU-Z.

Your best bet? Scan your entire system with another antivirus program. If nothing pops up, you're fine and can rest assured that the trigger-happy AVG was just doing a little too much to protect you.

RIDE THE LIGHTNING

Thanks for the article on syncing Google calendar and Sunbird (April 2008). Have you tried the Thunderbird extension Lightning? It integrates Sunbird with Thunderbird. I haven't tried it yet myself, but here's the link: ***http://tinyurl.com/2bvap9.***

—Ed Yeich

ASSOCIATE EDITOR DAVE MURPHY RESPONDS: That's correct—Sunbird and Lightning are the same application, save for the fact that Lighting allows you to use the calendar within Thunderbird, whereas Sunbird is a separate application. The same tricks that work with one should work just fine with the other. MPC

LETTERS POLICY: ***MAXIMUM PC*** invites your thoughts and comments. Send them to **input@maximumpc.com.** Please include your full name, town, and telephone number, and limit your letter to 300 words. Letters may be edited for space and clarity. Due to the vast amount of e-mail we receive, we cannot personally respond to each letter.

COMING NEXT MONTH IN MAXIMUMPC'S NIPPED AND TUCKED JUNE ISSUE

UPGRADING GUIDE

We take three different ho-hum PCs and turn 'em into power-user rigs. Use our advice to give your own machine a shot of adrenaline.

THE AUTOMATED HOME

Learn how to build and manage a home network that can control household appliances, lighting, entertainment needs, and security.

BUDGET ENCLOSURES

Only sub-$100 cases need apply for this roundup, which will answer the question: What enclosure should I buy if I want to save my money for performance parts?

KEN KIRBY'S

Super Bee

Ken Kirby might not know much about cars, but there's no denying that he's got quite a handle on case modding. He designed the Super Bee rig as a gift for his in-laws to replace their aging 700MHz Windows 98 machine.

Ken chose the Super Bee theme to appeal to his father-in-law's love of cars, especially Dodge muscle cars. The entire project was a breeze to complete, save for a few minor issues: Ken had a bit of trouble designing the top of the air filter on his processor's fan, and when he first fired up his rig, nothing happened—his motherboard was completely shot.

One quick trip to the computer store solved the problem, and soon enough the Super Bee was up and running.

Instead of a 426 Hemi, this Super Bee rocks an Athlon X2 3800+ processor, 1GB of Corsair RAM, and a GeForce FX 6600.

uired the customized parts for the nt off of eBay, including the Super od logo and fender "bee."

Ken started with a green Aspire X-Discovery l used flat-black highlights to mimic a s look!

winning entry, Ken wins a $250 gift cate to fund his modding madness! page 92 for contest rules.

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